

## **Appendix E1: Recruitment Procedures**

The NLST targeted accrual of 50 000 male and female smokers and former smokers, age 55–74 years, at 33 sites across the United States. This RCT was officially launched on September 18, 2002, although some participants were enrolled as early as August 2002. At each site, potential participants were identified and contacted through a variety of methods. Participants were assessed for eligibility and, if eligible, were consented by using institutional review board–approved informed consent materials and randomized to one of the two trial arms—low-dose CT or chest radiography.

Most NLST screening sites utilized direct mass mailings. This was the most effective recruitment strategy. National Cancer Institute communication and educational resources, local media (newspaper, radio, television) announcements, presentations to community groups at clinics, churches, and meetings of special interest groups also were utilized. With the completion of participant accrual and screening, efforts are now focused on continued communication with participants and identification of trial endpoints through such communication.

The NLST made a concerted effort in the recruitment of participants from minority populations. Assistance with minority recruitment efforts was received from the National Cancer Institute's Cancer Information Service Partnership Program, the American Public Health Association's Black Caucus of Health Workers, National Cancer Institute's Spirit of Eagles Program, and the American Cancer Society. Targeted minority recruitment activities were conducted at certain sites whose catchment areas had relatively large minority populations and included participation of NLST investigators at minority-focused conferences and events, translation of study materials into Spanish, distribution of minority-focused press kits to numerous and varied media outlets, direct mailings to local minority communities, and advertisements in local minority newspapers.

## **Appendix E2: Qualification of NLST Readers**

Radiologist qualifications required certification by the American Board of Radiology or equivalent, documented training in diagnostic radiology and radiation safety, involvement in the supervision and interpretation of at least 300 chest CT acquisitions in the past 3 years and at least 200 chest radiographic acquisitions per year, and participation in continuing medical education in accordance with the American College of Radiology standard. Approval for NLST also required review of a dedicated NLST training set, created by a subgroup of radiologists, which described acceptable CT and chest radiographic acquisition parameters and image quality requirements, and provided examples of various focal lung opacities with corresponding interpretations to promote a uniform knowledge base across sites.

## **Appendix E3: Medical Record Abstraction**

Diagnostic evaluation and outcomes information is collected on all participants who have a positive screening result (ie, suspicious for lung cancer) or who have a diagnosis of lung cancer in the absence of a positive screening result. To assess the overall health care utilization triggered by the screening process and to provide information for a cost-effectiveness analysis, all NLST-ACRIN sites collect and abstract data on all reported health care for a random sample of 5% of participants with a positive screening result and 5% of participants with a negative screening result at the baseline screening examination.

Abstraction is performed by certified medical record abstractors. For NLST-LSS, abstractors are employed by the screening centers, and for NLST-ACRIN, abstractors are employed by an abstracting firm and perform their tasks centrally through a subcontract to that group. After written participant permission is received, medical records are obtained from health care providers, medical facilities, and hospitals (including pathology departments); such efforts often involve intensive efforts. Both NLST-LSS and NLST-ACRIN monitor the quality of chart abstraction through re-abstraction of selected medical records.

Medical record abstractors must have demonstrated knowledge of medical record terminology, anatomy, physiology, and concepts of disease in addition to basic medical coding instruction. A minimum of 2 years of medical abstraction experience is required. Nosologists must have certification by at least one of the approved credentialing agencies for *International Classification of Diseases, 9th revision, Clinical Modification* and *International Classification of Diseases for Oncology, 3rd edition*. Cancer information is abstracted by certified tumor registrars.

## **Appendix E4: Endpoint Data Collection**

The collection of data for the primary endpoint (lung cancer mortality) follows a standard protocol with numerous checks and verifications. In NLST-LSS, annual participant contact occurs through an active follow-up process involving the Annual Study Update questionnaire. The Annual Study Update is administered by way of telephone or is mailed to participants annually after the 1st year of enrollment. The form queries participants as to cancer diagnosed in the previous year and date of any diagnosis. Cases reported on the Annual Study Update are then confirmed by using medical records and pathology reports. Updated participant contact information is ascertained concurrently with administration of the Annual Study Update. If a participant fails to complete either form, he or she is contacted by a screening center staff member. Notification of deaths occurs through information from next of kin, health care providers, obituaries, and National Death Index searches.

NLST-ACRIN utilizes a similar process. Follow-up involves administration of a standardized form at 6-month intervals. The form contains questions on health status and health care utilization, including questions about the date and type of cancers diagnosed in the preceding 6 months. Reported cancers are verified by using medical records and pathology reports. As is the case with NLST-LSS, notification of deaths also occurs from information provided by next of kin, health care providers, obituaries, and National Death Index searches.

Both NLST-ACRIN and NLST-LSS collect death certificates for all reported deaths. For deaths selected for endpoint verification process, medical records that cover events surrounding the death are collected.

## Appendix E5: Medical Procedures and Complications of Interest

### Medical Procedures of Interest

Biopsy – Endobronchial	Biopsy – Lymph node, scalene/supraclavicular nodes
Biopsy – Lymph node, other (specify)	Biopsy – Open surgical
Biopsy – Percutaneous adrenal	Biopsy – Percutaneous liver
Biopsy – Percutaneous lung-yielding histologic finding	Biopsy – Thoracoscopic
Biopsy – Transbronchial	Biopsy – Other (specify)
Bronchoscopy without biopsy or cytology	Clinical evaluation
CT – Abdomen (or liver)	CT – Abdomen and pelvis
CT – Brain	CT – Chest, plus contrast-enhanced nodule densitometry
CT – Chest, diagnostic	CT – Chest, low dose spiral
CT – Chest, limited thin section of nodule	CT – Chest, limited thin section of entire lung
CT – Chest and abdomen	CT – Chest, abdomen, and pelvis
CT – Other (specify)	Cytology – Bronchoscopic
Cytology – Percutaneous transthoracic	Cytology – Sputum
Cytology – Other (specify)	Echocardiography
Fluoroscopy	Lymphadenectomy/lymph node sampling
Mediastinoscopy or mediastinotomy	MR imaging – Abdomen (or liver)
MR imaging – Bone	MR imaging – Brain
MR imaging – Chest	MR imaging – Other (specify)
Pulmonary function tests or spirometry	Radiograph – Bone
Radiograph – Chest	Radiograph – Comparison with historical images
Radiograph – Other (specify)	Radionuclide scan – Bone
Radionuclide scan – Brain	Radionuclide scan – fluorine 18 fluorodeoxyglucose PET scan
Radionuclide scan – Fusion PET/CT scan	Radionuclide scan – Gallium
Radionuclide scan – Liver	Radionuclide scan – Somatostatin receptor
Radionuclide scan – Ventilation/perfusion lung	Radionuclide scan – Other (specify)
Resection	Thoracentesis
Thoracoscopy	Thoracotomy
Ultrasonography (specify)	Other (specify)
Unknown	

### Complications of Interest

Acute respiratory failure	Allergic reaction
Anaphylaxis	Blood loss requiring transfusion
Bronchopulmonary fistula	Bronchial stump leak requiring tube thoracostomy or other drainage for more than 4 days
Bronchospasm	Cardiac arrest
Cardiac arrhythmia requiring medical intervention	Cerebral vascular accident or stroke
Congestive heart failure	Death
Empyema	Fever requiring antibiotics
Hemothorax requiring tube placement	Hospitalization after procedure
Infection requiring antibiotics	Injury to vital organ or vessel
Myocardial infarction	Pain requiring referral to a pain specialist
Pneumothorax requiring tube placement	Prolonged mechanical ventilation more than 48 hours after surgery
Respiratory arrest	Rib fracture(s)
Thromboembolic complications requiring intervention	Vasovagal reaction
Vocal cord immobility or paralysis	Wound dehiscence
Wound infection	Other (specify)
Unknown	

## **Appendix E6: Biospecimen Collection**

Serial specimens of blood, urine, and sputum were collected at 15 NLST-ACRIN screening centers in a total of 10 208 participants at study entry and at each of the two subsequent screening visits. Participants providing biospecimens were required to provide informed consent for future use of their specimens in scientific research. Biospecimens are kept in a central biorepository at the University of Colorado Lung SPORE Tissue Bank. NLST-ACRIN plans to link biospecimen data with clinical and imaging data.

NLST-ACRIN and NLST-LSS are collecting paraffin blocks from resected lung tumors. A slide from each block is cut and reviewed by one expert lung cancer pathologist to ensure consistency of cored areas. Tissue microarrays are then constructed by a laboratory at the University of California, Los Angeles and stored for subsequent studies. NLST-ACRIN tumor data will be linked to data from biospecimens and NLST-ACRIN-only substudies, and NLST-ACRIN and NLST-LSS tumor data will be linked to data collected as part of trial-wide operations.

## **Appendix E7: Quality Control**

### **Data Collection**

Under the direction of the NLST Executive Committee, NLST-ACRIN and NLST-LSS developed mechanisms for quality control. The two components of the NLST standardized their data collection procedures and the data elements collected, and each component has a detailed manual of operations and procedures. Prior to trial launch and throughout the life of the trial, critical study materials, such as primary data collection forms, were and continue to be harmonized. Both NLST-ACRIN and NLST-LSS hold in-person or telephone-based training on all trial activities for screening center coordinators, abstractors, investigators, radiologists, and other study personnel. Acquisition of accurate and complete data is achieved through secure Internet-based transmission by the screening centers. To ensure that data are plausible, systems utilized for data transmission contain logic checks, and collected data are reviewed by trial statisticians, epidemiologists, and programmers during preparation for Data and Safety Monitoring Board meetings. Annual site visits, which involve review of operations and auditing of study records, are conducted for both NLST-ACRIN and NLST-LSS screening centers. NLST-ACRIN site visits are conducted by an ACRIN audit team, while NLST-LSS site visits are conducted by a National Cancer Institute audit team that includes personnel from the NLST-LSS Coordinating Center. These site visits are an invaluable part of trial operations; they allow trial personnel to share their experiences with trial leaders, thus allowing leaders to understand how procedures are implemented in the field. Procedures are revised as necessary.

### **Screening Equipment and Imaging**

The Physics Subcommittee of NLST-ACRIN and the NLST-LSS Quality Assurance Working Group oversaw image and screening equipment quality assurance. All low-dose CT and chest radiographic equipment used for NLST imaging had to meet standards published by the American College of Radiology (52,53). Specifications were set for all acquisition parameters, and through the aforementioned quality assurance committees, detailed, platform-specific, image acquisition charts were developed to ensure standardization of low-dose CT image quality at all sites.

Rigorous image quality review was performed during the screening phase of the trial. In NLST/LSS, four radiologists reviewed approximately 430 CT and 430 CXR examinations per year, and quarterly, visited study sites that used screen-film chest radiographic acquisition to review image quality. In addition, an NLST-LSS Quality Assurance radiologist participated in the annual screening center site visits. In NLST-ACRIN, five radiologists reviewed a subset of at least 25 CT and chest radiographic studies each month. If image quality was suboptimal, limitations were recorded and communicated to the study sites. Images to be reviewed were selected randomly by the two coordinating centers.

## Personnel

Protocol dictated that the NLST radiologists are American Board of Radiology certified or board-eligible or have equivalent qualifications delineated by the American College of Radiology Practice Guidelines such as a foreign board certification. A valid active medical license in the state in which screening was performed was also required. Radiologic technologists were required to hold certification from the American Registry of Radiology Technologists. In addition, technologists and radiologists were required to meet additional guidelines set forth by the American College of Radiology (52,53). In rare instances, persons without the aforementioned qualifications were allowed to work on the NLST-LSS if screening center principal investigators documented that the staff member had adequate training and experience; such justifications required approval by National Cancer Institute prior to a staff member's participation in trial activities. Technologists and radiologists also were required to complete NLST-specific training courses (conducted either in person or on compact disc) prior to trial involvement.

52. American College of Radiology. ACR technical standard for diagnostic medical physics performance monitoring of computed tomography (CT) equipment. In: Standards 2003-2004. Reston, Va: American College of Radiology, 2002; 675-677.

53. American College of Radiology. ACR technical standard for diagnostic medical physics performance monitoring of radiographic and fluoroscopic equipment. In: Standards 2002-2003. Reston, Va: American College of Radiology, 2001; 665-668.

## Appendix E8: Parameters Used in Sample Size Considerations

Parameters for the Hu-Zelen model were estimated by using data from the Mayo Lung Project. Only those participants in the Mayo Lung Project who were between the ages of 55 and 74 and had a minimum of 30 pack-years of smoking at the time of entry into the trial provided data on which the estimates were based. The program used to implement the Hu-Zelen model accepts values of the input parameters, including the number of participants in each arm, and calculates the statistical power of the trial at specified points in time. The following are input parameters for power calculation:

1. There are 25 000 participants entering in year 1 of the trial, starting September 2002, and 25 000 participants enter in year 2.
2. Median survival time from the point of clinical detection for clinically detected incidence cases. Estimated from survival times of clinically detected cases in the Mayo Lung Project. Input value: 0.67 year
3. Median survival time from the point at which clinical detection would have occurred for incidence cases detected at chest radiography. Estimated from survival times of cases detected at chest radiography in the intervention arm of the Mayo Lung Project. A mean lead time of 1.3 years was assumed (54). Input value: 1.74 year
4. Median survival time from the point at which clinical detection would have occurred for prevalence cases detected at chest radiography. Estimated from survival times of cases detected at prevalence chest radiographic screening in the Mayo Lung Project. A mean lead time of 1.3 years was assumed (54). Input value: 1.53 year
5. Median survival time from the point of clinical detection for clinically detected prevalence cases. Computed as (input parameter 2)  $\times$  (input parameter 4)/(input parameter 3). Input value: 0.60 year
6. Median survival time from the point at which clinical detection would have occurred for incidence cases detected at helical CT. Input value: 2.42 year
7. Median survival time from the point at which clinical detection would have occurred for prevalence cases detected at spiral CT. Input value: 2.21 year
8. Type 1 error rate,  $\alpha$ . Input value: 0.05

9. Transition rate into the preclinical phase. Assumed equal to the transition rate into the clinical phase from the preclinical phase. Estimated from the incidence in the usual care arm of the Mayo Lung Project. Input value: 0.0067
10. Prevalence. Proportion of individuals in the preclinical phase at the time of entry into the NLST. The value of this parameter was taken to be slightly lower than the lung cancer detection rate for spiral CT reported by Henschke et al (28), leading to a more conservative estimate of sample size. Input value: 0.02
11. Sensitivity of chest radiography. Based on a study by Flehinger et al (55). Input value: 0.25
12. Sensitivity of spiral CT. Input value: 0.85
13. Compliance in chest radiographic arm. Input value: 0.80
14. Compliance in spiral CT arm. Input value: 0.85
15. Proportion of individuals not screened in each arm. Input value: 0.10
16. Number of screening examinations spaced 1 year apart. Input value: 3

The original power computations assumed that 25 000 participants would be enrolled in the 1st year of the study. However, the actual enrollment in the 1st year was 34 688. Given that 34 688 participants were enrolled in year 1, the magnitude of reduction that can be detected with 90% power is now 20%. Calculations assuming four or five screening examinations rather than three indicated that increasing the number of screening examinations beyond that number would result in modest increases in power at a considerable financial cost.

54. Shukla R, Deddens JA, Buncher CR. Survival benefits of x-ray screening for lung cancer after bias adjustments. *Comput Math Appl* 1989;18(10-11):937–948.
55. Flehinger BJ, Kimmel M, Polyak T, Melamed MR. Screening for lung cancer: The Mayo Lung Project revisited. *Cancer* 1993;72(5):1573–1580.

## **Appendix E9**

### **NLST Omnibus Article: Writers and Major Contributors**

#### **I. NLST Executive Committee**

Denise R. Aberle, MD

Christine D. Berg, MD

William C. Black, MD

Timothy R. Church, PhD, MS

Richard M. Fagerstrom, PhD

Barbara Galen, MSN, CRNP, CNMT \*\*

Ilana F. Gareen, PhD

Constantine Gatsonis, PhD

Jonathan Goldin, MD, PhD

John K. Gohagan, PhD\*

Bruce Hillman, MD\*

Carl Jaffe, MD\* \*\*

Barnett S. Kramer, MD, MPH

David Lynch, MD

Pamela M. Marcus, PhD

Mitchell Schnall, MD, PhD

Daniel C. Sullivan, MD\* \*\*

Dorothy Sullivan

Carl J. Zylak, MD

\* Former members: J.K.G., Founding Project Officer and Cochair Executive Committee, B.H. Founding ACRIN Chair, and D.C.S., Former Director, Cancer Imaging Program.

\*\* This article was written by the NLST Executive Committee with lead authors C.G. and B.S.K. who take full responsibility for its content. B.G., C.J., and D.C.S. did not serve as authors.

#### **II. Major Contributing Investigators**

##### NLST/LSS Project Officer

Christine D. Berg, MD

##### NLST/ACRIN Principal Investigator

Denise R. Aberle, MD

##### Chief Statisticians

Richard M. Fagerstrom, PhD, Constantine Gatsonis, PhD

### Lead Epidemiologists

Ilana F. Gareen, PhD, Pamela M. Marcus, PhD

### Lead Medical Physicists

Christopher Cagnon, PhD, Dianna Cody, PhD, Glenn Fletcher, PhD, Michael J. Flynn, PhD, Philip F. Judy, PhD, Randell Kruger, PhD, Frederick J. Larke, MS, DABR, Michael McNitt-Gray, PhD, Thomas Payne, PhD, J. Anthony Seibert, PhD, Xizeng Wu, PhD

### Lead Site Investigators

ACRIN:

Gerald Abbott, MD, Denise R. Aberle, MD, Judith K. Amorosa, MD, Richard G. Barr, MD, PhD, William C. Black, MD, Phillip M. Boiselle, MD, Caroline Chiles, MD, Robert Clark, MD, Lynn Coppage, MD, Robert Falk, MD, Elliot K. Fishman, MD, David Gemmel, PhD, Jonathan G. Goldin, MD, Eric Goodman, MD, Eric M. Hart, MD, Todd Hazelton, MD, Elizabeth Johnson, MD, Philip F. Judy, PhD, Ella Kazerooni, MD, Barbara McComb, MD, Geoffrey McLennan, PhD, MBBS, FRACP, Reginald F. Munden, MD, James Ravenel, MD, Michael Sullivan, MD, Stephen J. Swensen, MD, Drew A. Torigian, MD, MA, Kay H. Vydareny, MD, John A. Worrell, MD

LSS:

Peter Balkin, MD, Timothy R. Church, PhD, Mona Fouad, MD, Matthew T. Freedman, MD, MBA, Kavita Garg, MD, Edward P. Gelmann, MD, David S. Gierada, MD, William Hocking, MD, Subbarao Inampudi, MD, Claudine Isaacs, MD, Paul Kvale, MD, David Lynch, MD, Howard Mann, MB, BCh, William Manor, DO, Hrudaya Nath, MBBS, DMR, MD, Douglas Reding, MD, MPH, David L. Spizarny, MD, Diane C. Strollo, MD, John Waltz, MD

### Supporting Statisticians

Mei-Hsiu Chen, PhD, Fenghai Duan, PhD, Grant Izmirilian, PhD, Paul Pinsky, PhD, Philip C. Prorok, PhD

## **III. Additional Committees**

### Endpoint Verification Team

Anthony B. Miller, MB, Chair, Martin J. Edelman, MD, William K. Evans, MD, Robert S. Fontana, MD, Mitchell Machtay, MD

### LSS Screening Quality Assurance Working Group

David S. Gierada, MD, Chair, Kenneth W. Clark, MS, MBA, Kathy L. Clingan, Richard M. Fagerstrom, PhD, Glenn Fletcher, PhD, Michael J. Flynn, PhD, Melissa B. Ford, MSN, PhD\*, Kavita Garg, MD, Frederick J. Larke, MS, DABR, Guillermo Márquez, PhD, Steven M. Moore, MS, Hrudaya Nath, MBBS, DMR, MD, Peter Ohan, Thomas J. Payne, PhD, Steven Peace, CTR\*, Jennifer L. Rosenbaum, MPH, Diane C. Strollo, MD, Xizeng Wu, PhD

\*Former member.

### ACRIN Screening Quality Assurance Committee

Denise Aberle, MD, Richard Barr, MD, William Black, MD, Jonathan Goldin, MD, PhD, Drew Torigian, MD, Kay Vydareny, MD, John Worrell, MD

### Oversight Committee

Robert C. Young, MD, Chair, David Alberts, MD, David DeMets, PhD, Peter Greenwald, MD, DrPH, Paula Jacobs, MD, Theresa C. McLoud, MD, David P. Naidich, MD, James Tatum, MD

### Data and Safety Monitoring Board

Edward A. Sausville, MD, PhD, Chair, Wylie Burke, MD, PhD, Gene Colice, MD, Brenda Edwards, PhD, Scott Emerson, MD, PhD, John Fletcher, MD<sup>†</sup>, Sylvan Green, MD<sup>†</sup>, Russell Harris, MD, MPH, Jeffrey S. Klein, MD, Edward L. Korn, PhD, Robert Mayer, MD, Joe V. Selby, MD, MPH, David W. Sturges, JD, Bruce W. Turnbull, PhD, Thomas J. Watson, MD

<sup>†</sup> Deceased.

ACRIN Biomarker Research Evaluation Panel and Tissue & Biomarker Oversight Committee Denise Aberle, MD, Stephen Baylin, MD, Neil Caporaso, PhD, Philip Dennis, MD, Steve Dubinett, MD, Wilbur Franklin, MD, Constantine Gatsonis, PhD, William Grizzle, MD, Fred Hirsch, PhD, Pierre Massion, MD, Kathy McKeeta-Probeck, John Minna, MD, Edward Patz, MD, Margaret Spitz, MD

## **NLST Trial Investigators**

### **NLST/LSS: National Cancer Institute, Division of Cancer Prevention, Bethesda, Md**

#### Project Officer/Chief, Early Detection Research Group

Christine D. Berg, MD

#### Associate Project Officer/Chief, Biometry Research Group

Philip C. Prorok, PhD

#### Chief Statistician

Richard M. Fagerstrom, PhD

#### Epidemiologist

Pamela M. Marcus, PhD

#### Supporting Statisticians

Donald Corle, MS

Ping Hu, ScD

Grant Izmirlian, PhD

Paul Pinsky, PhD

#### Biomedical Engineer

Guillermo Márquez, PhD

#### Information Officer

Dorothy Sullivan

#### Program Specialist

Jennifer Gaegler

#### Former Project Officer

John K. Gohagan, PhD

#### Contract Officer

Susan Hoffman

#### Contract Specialists

Charles Jackson

Erin Lange

Evanthia Papadopoulos

### **National Cancer Institute, Cancer Imaging Program, Bethesda, Md**

#### Program Director, Diagnostic Imaging Branch, Cancer Imaging Program

Barbara Galen, MSN, CRNP, CNMT

#### Former Branch Chief, Diagnostic Imaging Branch, Cancer Imaging Program

Carl Jaffe, MD

**National Institutes of Health, Office of Disease Prevention, Bethesda, Md**

Barnett S. Kramer, MD, MPH

**NLST/ACRIN: American College of Radiology Imaging Network**

NLST/ACRIN Principal Investigator

Denise Aberle, MD

NLST/ACRIN Chief Statistician

Constantine Gatsonis, PhD

NLST/ACRIN Epidemiologist

Ilana Gareen, PhD

**ACRIN Headquarters and Data Management Center, Philadelphia, Pa**

Mitchel Schnall, MD, ACRIN Chair

Administrative Staff

Charles Apgar, MBA

Anna Boyle

Tom Caldwell, MBA

Nancy Fredericks, MBA

Deborah Harbison

Donna Hartfeil, RN, BSN

Sharon Jones

Steve King, MS, CHE

Irene Mahon, RN, MPH

Rosa Medina

Cindy Masiejczyk

Peter Zamora

Information Technology

Hank Brastater, PMP

Vish Iyer, MS

Jincy George, MCA

Dinakar Gopalakrishnan

Protocol Development & Regulatory Compliance

Patricia Blair

Michael Bradley, MA  
Cheryl Crozier, RN, ASQ, CQA  
Maria Oh  
Nicole Spiese, MS  
Chris Steward  
Mary Kelly-Truran, RN, CCRP  
Tess Thompson, MPhil  
Image Management Center  
Erin Cunningham, MHSA  
Anthony Levering,  
Kathleen McMurtrie  
Michael Nahill  
Sharlene Snowden  
Kesha Smith  
Fraser Wilton  
Timothy Welsh  
Rex Welsh  
Data Management Staff  
Wendell Christie  
Stephanie Clabo  
Roberta Clune  
Natalie Cunningham  
Jamie Downs  
Lindsey Dymond  
Julianne Falcone  
Shani Harris  
Pamela Harvey, MMgt  
Jane Hill  
Laura Hill  
Donna Letizia  
Kendrick Looney  
Hugh McGinley  
Angelee Mean, MHA  
Marcella Moore, MBA  
Ryan Norton

Valentina Ortico  
Sophia Sabina, MBA, RTRT  
Robert Sole  
JoAnn Stetz, RN, RTT  
Arnold Ssali, MPH  
John Stubblefield  
Tina Taylor  
Shovonna White

**ACRIN Biostatistics Center, Brown University, Providence, RI**

Director

Constantine Gatsonis, PhD

Faculty Statisticians

Mei-Hsiu Chen, PhD

Fenghai Duan, PhD

Bo Lu, PhD

Faculty Epidemiologist

Ilana F. Gareen, PhD

Staff Biostatisticians

Amanda Adams, MPH

Sarah Baum, MS

Meridith Blevins, MS

Patricia Fox, MS

Vincent Girardi, MS

Jeremy Gorelick, PhD

Edward Hunt, MS

Quentin McMullen,

Karthikeyan Meganathan, MS

Regina Rendas-Baum, MS

JoRean D. Sicks, MS

Bradley Snyder, MS

Melanie Yeh, MS

Quality of Life Interviewers

Maryann Duggan

Cheryl Souza

## **Westat, Rockville, Md**

### Corporate Officer

Jack Cahill, MA

### Project Director

Brenda K. Brewer, MMSc

### PLCO Project Director

Barbara O'Brien, MPH

### Protocol Managers

Melissa B. Ford, MSN, PhD

Jennifer L. Rosenbaum, MPH

### Study Managers

Gillian Devereux, RN, MPH

Melissa S. Fritz, MPH

Miriam Galbraith, RN, MPH

Judith Harkins, RN, MPH

Kristen J. Keating, PhD

Kirk Midkiff, MPH

Steven Peace, CTR

Usha Singh, MPH

Thea Zimmerman, MS

### Data Quality Manager

Kathy L. Clingan

### Coordinators

Nancy Payte, PhD, MPH, CTR

Helen Price

### Systems Managers

Clifford Caughman, MS

Ramachandra Chanapatna

### Systems Staff

Mike Florzyk

Annabelle Lee

Alan Morgan

Peter Ohan

Jennifer Yang

### Data Processing Manager

L. Ellen Martinusen

Data Processing Staff

June McSwain

Rhonda Rosario

Jagdish Singh

Project Administrator

R. Adam DeBaugh

Medical Information Managers

Sharan Campleman, PhD

Mary Mesnard, CTR

Lawrence Ragard, MD

Medical Record Coders

Terry Lewis

Lois M. Roberts

Research Assistants

Vijayasri Narayanaswami

Vanessa Ralda

**Information Management Systems, Rockville, Md**

Corporate Officer

William Lake, Jr

Project Manager

Thomas Riley

Systems Analyst

Jonathan D. Clapp

Senior Systems Analyst

Joe Austin

Senior Programmer/Analyst

Brian Irons

FangFang Xu, MIS

Programmer/Analyst

Gordon C. Jones, MS

Michael Young

Senior Programmer

Andrew Goodman

Crissy Kibic

## **Care Communications**

### Project Director

Patricia Sheridan, MBA, RHIA

### Project Managers

Nancy Kadish, MS, RHIA, CAPM

### Research Managers

Denise Moline, RHIA

Rachel Phillips, RHIA

### Abstractors and Cancer Registrars

Michele Adkinson, CCS

David Creed, RHIT, CTR

Tammy DeCoste, RHIT, CTR

Debbie Gembala, RHIA

Sally Hurst, RHIA

Elizabeth King, RHIT

Joy Knowles, RHIA, CTR

Pamela McBride, RHIT, CCS

Patricia Pangburn, RHIT

Judy Preston, RHIA

Karen Stokes, RHIT

Patricia Tesch, RHIA, CTR

Susan Wenmoth, RHIA

### Endpoint Verification Process Coders

Linda Galocy, RHIA

Deanna Mandley, RHIT, CCS, CCS-P

Pamela McBride, RHIT, CCS (Arbitrator)

Gail Orvis, RHIT, CCS

## **NLST/LSS Screening Center Staff: Georgetown University Medical Center, Washington, DC**

### Principal Investigator

Claudine Isaacs, MD

### Former Principal Investigator

Edward P. Gelmann, MD

### Co-Principal Investigator and

### Lead Radiologist

Matthew T. Freedman, MD, MBA

Radiologists

Alphonso Dial, MD

Letitia Clark, MD

Lawrence Cohen, MD

Joanne Gerber, MD

Carlos Jamis-Dow, MD

Erini Makariou, MD

Ed Smith, MD

Study Coordinators

Amy Garrett, MA, CCRC

Colleen McGuire, RN, MSN

Sarah Neff, MPH

Tara Riley

Medical Records Abstractors

Sara Cantrell, CTR

Glynis Marsh, CTR

Chispina Wray, CTR

Baigalmaa Yondonsambuu, MD, CTR

Medical Record Coordinator

Ulander Giles

Recruitment Coordinator

Morgan Ford, MPH

Data Managers

Venus Brown

Amy Lita Evangelista

Tiffanie Hammond

Jillian Nickel

Research Assistants

Michael Brangan

Michele Lee

Cindy Lin

CT and Radiographic Technicians

Elanor (Candi) Adkins

George Armah

Christopher Blue

Venetia Cooke  
Natalie Gray  
Marianna Gustitis  
Lakisha Hawkins  
Grace Isaacs  
Mimi Kim  
Malcolm King  
Kanya Kumbalasiri  
Robin Laura  
Kelly McDaniel  
Alem Mulugeta  
Leroy Riley  
Shane Sorrell  
William Thomas  
Lisa Woodard

**Henry Ford Health System, Detroit, Mich**

Principal Investigator/Pulmonologist

Paul Kvale, MD

Co-Investigators/Epidemiologists

Christine Cole Johnson, PhD

Martin Tammemagi, PhD, DVM

Co-Investigators/Radiologists

David Spizarny, MD

Carl Zylak, MD

Co-Investigator/Medical Physicist

Michael Flynn, MD

Biostatisticians

Gordon Jacobsen PhD

Steadman Sankey, PhD

Lonni Schultz, PhD

Project Coordinators/Research Staff

Kalin Albertsen

Karen Broski

Gena Kucera, PhD

Kathleen Poler, MPH

Cheryl Spoutz-Ryan

Dawn Thomas, MPH

Grant Administrators

Evangeline Griesemer

Bonnie Kwit

Clinical Staff

Patricia Fantuz

Beth McLellan

Dawn Simmons

Programmer

Yasmeen Hafeez

Noel Maddy

Data Managers

LaTonja Davis

Rodkise Estell

Susanne Kozakowski

Jennifer Rowe

Merideth Stanley

Xiuli Zhang

Abstractors

Mary Ellen Frebes

Margaret Paquette

Mirjana Tecmire

Laura Young

Data Entry Staff

Deborah Greene

Cynthia Hill

Kathleen Young

Interviewers

Karen Bellware

Kay Bohn

Nancy Caird

Helen Fink

Sandra Fiarman

Melissa Houston

Ann Jolly

Carissa Krzeczowski

Cynthia Mack

Lakeshia Murray

Anna Nanovski

Debra Rempinski

Heather Tumberlinson

Debbie William

Administrative Support

Eleace Eldridge-Smith

Vanessa Graves

Nora Szabo

**Marshfield Clinic Research Foundation, Marshfield, Wis**

Principal Investigator

Douglas Reding, MD, MPH, FACP

Co-Principal Investigator

William Hocking, MD

Radiologist

William Manor, DO

Pulmonologist

John Crump, MD

Medical Physicist

Randall Kruger, PhD

Epidemiologist

Robert Greenlee, PhD

Study Coordinator and Manager

Karen Lappe, BSN

Assistant Manager and Data Manager

Deb Multerer

Medical Records Abstractors

Denise Kriescher, RN

Amy Vieth, BSN

Sheila Wein, BSN

Medical Abstraction

Dawn Fuehrer

Christine Gjertson

June Krebsbach

Craig Kuhlka

Karen Lutthrop, CTR

Judy Netzer

Jean Wegner

Recruiter

Virginia Fischer, MS

CMA

Kay Mathiesen-Viergutz

LPN

Karen Kofka

Appointment Coordinators

Nikki Jablonsky

Brooke Johnson

Terrie Kitchner

Lin Mueller

Amy Rueth

Shirley Wachholz

Data Entry/Office Staff

Kari Bohman

Marilyn Bruger

Kari Ranae Kramer

Katie Kuenhold

Camille Mueller

Cathy Mueller

Laura Multerer

Sue Zahradka

Radiologists

Janan Alkilidar, MD

Nandita Bhattacharjee, MD

Christopher Cangelosi, MD

Robert Carlson, MD

Alon Coppens, MD

Margo Cousins, MD

Barry Edelstein, MD  
Kristin Gerndt, MD  
Jeffrey Heffernon, MD  
Thomas Hinke, MD  
Mark Hinson, MD  
Lawrence Hutchins, MD  
Kristin Lieberman, MD  
William Manor, DO  
Gerald Mulligan, MD  
Emmanuel Omoba, MD  
Todd Risa, DO  
John Sheflin, MD  
Tim Swan, MD  
John Warner, MD  
Alan Williams, MD

**Pacific Health Research and Education Institute\*, Honolulu, Hawaii**

Principal Investigator

Lance Yokochi, MD, MPH

Co-Principal Investigator

Peter Balkin, MD

Co-Investigators

Roy Adaniya, MD

Karen Glanz, PhD

James Navin, MD

Vicki Shambaugh, MPH, MA

Frank Tabrah, MD

Bradley Willcox, MD

Paulette Williams, DrPH

Co-Investigator/Senior Biostatistician

Qimei He, PhD

Study Coordinator

Victoria Jenkins, BSN, MEd

Medical Records Abstractors

Kathleen Bow, BSN, Lead

Jean Tsukamoto, RN

Shirleen Hyun

Programmers

Ed Brown

Howard Morrow

Clinic Supervisors

Kimberly Stryker, RN

Helene Shiratori, BSN

Research Associates

Peggy Lau

Donna Au

Recruitment/Retention

Wendy Francis

Liz Dolan

Research Assistants

Jazman Brooke

Marilyn Calulot

Victoria Chun

Kathryn Rabanal

Joy Tani

Cheryl Lewis

June Morfit

Amy Brunst

Data Manager

Louisa Turner

Data Assistants

Gladys Hino

Anne Chung

Constance Elbon-Copp

William Huynh

Myrle Johnson

Esther Nakano

Lilian Villaruz

\*Pacific Health Research Institute prior to July 20, 2010

**University of Alabama at Birmingham, Birmingham, Ala**

Principal Investigator

Mona N. Fouad, MD, MPH

Co-Principal Investigator and Lead Radiologist

Hrudaya Nath, MD

Co-Principal Investigators

William C. Bailey, MD

Robert Garver, MD

Physicist

Xizeng Wu, PhD

Radiologists

Dale Brawner, MD

Ian Malcomb, MD

Desiree Morgan, MD

Patricia C. Sanders, MD

Arthur Sandy, MD

Martin Schwartz, MD

Satinder Singh, MD

Pulmonologist

Mark Dransfield, MD

Study Coordinators

Darlene Higgins

Alisha Moore, CRNP

Data Management Staff

Aras Acemgil

Tony Blake

Jing Lee

Sam Quattlebaum

Julie Schach

Data Entry

Tawny Martin

Lead Abstractor

Rekha Khatri, MD, MPH, CTR

Medical Records Abstractors

Wahied Gendi, MD

Beverly Powell, CRNP

Clinical Center Staff

Carolyn Johnson, RN

Julie Sears, RN

Interviewers/Schedulers

Shari Jordan

Vicki Prayer

Carole Walker

Recruitment/Retention Staff

Mel Johnson

Joanice Thompson

**University of Colorado Denver, Aurora, Colo**

Principal Investigator

E. David Crawford, MD

Co-Principal Investigator

Kavita Garg, MD

Co-Investigators

Paul Bunn, Jr, MD

Eduard Gamito

David Lynch, MD

Sheryl Ogden, RN

Medical Physicist

Frederick J. Larke, MS, DABR

Project Coordinators

Shannon Pretzel

Lauren Ramsay, PA-C

Carol Vaughn

Clinic Coordinator

Cheri Whiton

Recruitment Coordinators

Donna Sammons

Laura Springhetti

Hispanic Recruitment Coordinator

Sally Tenorio, RN

Medical Records Abstractors

Nichole Cadez

Sydney Laster

Programmer

Colin O'Donnell

Data Managers

Joe Hughes

Jennifer Garcia Livingston

Garry Morrison

Wendy Moss

Merri Mullennix

Marissa Peters

Hakan Sahin, MD

Meredith Slear

Clinic Assistants

Mike Burck

Carolyn Hill

Emily Jewitt

Imaging Library Assistant

Ryan Pena

Administrative Assistants

Eda Ordonez

Gina Sammons

Student Assistants

Jhenny Hernandez

Alejandra Reyes

Analisa Somoza

**University of Minnesota School of Public Health, Minneapolis, Minn**

Principal Investigator

Timothy R. Church, PhD, MS

Co-Principal Investigator

Martin Oken, MD

Co-Investigator

Subbarao Inampudi, MD

Radiologists

Deborah Day, MD

Kevin Edelman, MD

Tammy Fox, MD

Scott Gaerte, MD  
Karla Myra-Bloom, MD  
Michael Plunkett, MD  
Frederick Olson, MD  
Paul Rust, MD  
Lisa Schneider, MD  
Beverly Trombley, MD  
Thomas Vahey, MD

Medical Physicist

Thomas J. Payne, PhD

Data and Computer Support Staff

Ann Bangerter  
Terri David-Schlegel  
Donna DesMarais  
Sue Frederickson  
Mindy Geisser  
Natalya Portnov  
Greg Silverman  
Frank Stahan  
Simone Vuong  
Gavin Watt  
Joe Woodside  
Aaron Zirbes

Medical Records Abstractors and Support Staff

Sophie Breer  
Cheri Haselhuhn  
Cathy Longden  
Candace Mueller  
Marianne Rice  
Deb Warren

Phoning Staff

Susan Collins  
Stephanie Levi  
Janet Manual  
Lea Matous

Phyllis Olsson

Sue Peterson

Christopher Rogers

Mary Lynn Steele

Minneapolis Screening Center Nursing Staff

Patty Beckmann

Linda Jurjans

Shirley Terrian

Minneapolis Screening Center Administration Support Staff

Sally Fraki

Martha Fronheiser

Linda Heinrichs

Deb Kirby

Jackie Seivert

Carol Steinberg

Marge Watry

St. Cloud Screening Center Administration Support Staff

Karen Boyle

Andrew Burnside

Rena Kiffmeyer

Wendy Mosiman

Indianapolis Screening Center Administration Support Staff

Angie Bailey

Pamela Byrnes

Laura Stark

Mary Weston

Dawn Whistler

Coordinators

Jill Cordes

Deb Engelhard

Administrative Support Staff

Jackie Becker

Peggy Bradley

Jim Fisher

Heather McLaughlin

Ana Maria Mendez

Deanna Miller

Rosalie Ronan

Brad Siga

**University of Pittsburgh Medical Center, Pittsburgh, Pa**

Principal Investigator

Joel L. Weissfeld, MD, MPH

Co-Investigators

Mark D. Salerno, MD

Jeffrey Schragin, MD, MPH

Diane Strollo, MD

Thomas E. Warfel, MD

Patrick W. Wolfe, MD

Radiologists

Dominick A. Antico, MD

Matthew T. Bee, MD

Donald F. Bittner, MD

William T. Corey, MD

Robert A. Hawkins, MD

William T. Herbick, MD

Mukesh P. Karwat, MD

Kevin J. Leonard, MD

Constantine N. Petrochko, MD

Scott F. Pickering, MD

Paul E. Smart, MD

Phyllis J. Walters, MD

Jane A. Zehner, MD

Coordinator

Jeffrey Schragin, MD, MPH

Recruiters

Karen Augustine

Sue Misko

Monica Richel

Mary Alyce Riley, RN, MSN

Linda Warren, RN

Data Manager

Kathy McDonough

Medical Record Abstractors

Beverly Rozanok, CTR

Jeffrey Schragin, MD, MPH

Data and Computer Support Staff

Juanita Helms

Peggy Olson

Steve Uttecht

Mike Wirth

Administrative Support Staff

Roni Atkins

Lisa Clement, CRNP

Deb Gurtner

Laura Jones

**University of Utah Health Science Center, Salt Lake City, Utah**

Principal Investigator

Sandra S. Buys, MD

Lead Radiologist

Howard Mann, MD

Study Radiologists

Ralph Drost, MD

Kathleen Murray, MD

Kenneth Nowers, MD

Physicists

Peter Jenkins, MD

Dave Tripp, MD

Study Coordinators

Gabe Herron

Eduard Van Stam

Julie Varner

Research Nurse

Karen O'Toole, RN

Data Managers

Cassie Olson

Derek Omori

Data Collection and Data Entry Staff

Adriane Andersen

Neil Argyle

Jennifer Avrin

Jennifer Bacon

Mark Broschinsky

Chani Montalbo

Kimberly Nolan

Anne Randall

Karen Schleip

Scott J. Sheltra

Roger Tischner

Christopher Toyn

Kyle Turner

Brianne Whittaker

Eddy Wicklander

Jacob Wolf

Recruitment Staff

Cherie Dalton

Briar Doi

Jeff Childs

Lisa Gren

Anne Randall

Darcy Watson

Lead/Medical Record Abstractor

Julie Varner, CPC, CTR

PACS Administrator

Tony Jones

Medical Imaging Manager

Bruce Neilson

Radiology Technicians

Hector Ahumada

Hassan Bourija

Christine Brown

Barbara Ferris  
Leanne Hadfield  
Kylee Hansen  
Jeffrey Koford  
Sally Kopesec  
Amy Lloyd  
Mindy Lofthouse  
Saeed Matinkhah  
Virginia May  
Shanna Nichols  
Alesis Nieves  
Misty Oviatt  
Nicole Richardson  
Angela Lee Rowley  
Ellen Sandberg  
Dave Scholl  
Shauna Lyn Seguin  
David Shea  
Suzanne Smith  
Patricia Ann Street  
Marcie Walters  
Ralph Weiben  
Lynly Wilcox  
Ray Zisumbo

**University of Utah Boise Satellite Center, Boise, Idaho**

Co-Principal Investigator

Thomas M. Beck, MD

Lead Radiologist

John S. Waltz, MD

Study Radiologists

Shane Ball, MD

Todd B. Burt, MD

Elaine N. Daniel, MD

Quinn A. DeMordaunt, MD

Michael T. Fisher, MD

Michael A. Fuchs, MD  
Bruce E. Hubler, MD  
Chris J. Jennings, MD  
Richard H. Lane, MD  
Craig E. Leymaster, MD  
Loren C. Macey, MD  
Steven V. Marx, MD  
James R. Maxwell, MD  
Brent D. Nelson, MD

Physicist

Jeff Fairbanks, PhD

Study Coordinator

Bonita Wohlers, RN, MS

Data Manager

Jill Heinz

Administrative Assistant

Kathy Berreth

PACS Administrator

Randy Marshall

Medical Imaging Manager

Jerry Brekke

MI Staff

Kelly Jones

Radiology Technicians

Amber Barrow

Douglas Bashford

Barry Clot

Troy Cook

Leslie Dobson

Andrea Hamilton-Foss

William Hanson

Jan E. Hyder

Cindy Lewis-Burke

Stacey Mitchell

Marlea Osterhout

Karen Patella  
Phillip Peterson  
Sandra Schornak-Curtis  
Lisa Sirianni  
Larry Stoller  
Korinna Vigeant  
Cheryl Whistle  
Jeff Yates

**Washington University School of Medicine, St Louis, Mo**

Principal Investigator

Gerald Andriole, MD

Co-Principal Investigator and Lead Radiologist

David S. Gierada, MD

Study Radiologists

D. Claire Anderson, MD

Sanjeev Bhalla, MD

Andrew J. Bierhals, MD

Jason Bronfman, MD

Harvey S. Glazer, MD

Fernando R. Gutierrez, MD

Guillermo Geisse, MD

Lawrence M. Kotner, MD

Cylen Javidan-Nejad, MD

Kianoush Rezai, MD

Stuart S. Sagel, MD

Janice W. Semenkovich, MD

Marilyn J. Siegel, MD

Dallas Sorrel, MD

Pamela K. Woodard, MD

Physicists

David Engelhart, MS

Glenn Fletcher, PhD

Study Coordinator

Robin Haverman, RT

Site Coordinators

Angela Campbell, RT

Vivien Gardner, RN, BSN

Danielle Gherardini, RN, BSN

Lynn Hoese, RN

Ruth Holdener, RT

Louise Ledbetter, RN

Patricia Nieters, RN, BSN

Cynthia Reiners, RN

Jeanine Wade, RT

Mary Wiseman, RN

Data Manager

Patricia Ruelweler

Data Entry Staff

Rochelle Williams

Programming Staff

David Chi

Tim Budd

Lead Abstractors

Sydney Laster

Janise Webb

Medical Records Abstractors

Celia Stolin, RHIT

Medical Record Clerical Staff

Kathy Garrett

Elizabeth Fleming

Clinical Center Staff

Elaine Freesmeier

Jennifer Frye

Deborah Graham

Helen Kaemmerer

JoAnn Nevilles

Kathy Taylor

CT Image Library Staff

James Blaine, DSc

Kenneth Clark, MS, MBA

David Gierada, MD

Paul Koppel, PhD

David Maffitt, MS

Stephen Moore, MS

Joan Molton

Stanley Phillips

Fred Prior, PhD

Mary Wolfsberger

CTIL Image Viewers

Angela Cosas

Sooah Kim, MD

Miyoung Kim, MD

Yuting Liang, MD

Patricia Ruelweler

Rochelle Williams

Biostatistician

Thomas Pilgram, PhD

Telephone and Recruitment Staff

Amy Haas

Divine Hartwell

Dana Roeshe

Administrative Support Staff

Adelheid Lowery, RN

Shelly Meese

Kate Naughton

Roberta Yoffie, RT

Imaging Quality Assurance

James Blaine, DSc

Kenneth Clark, MS, MBA

Paul Koppel, PhD

David Maffitt, MS

Stephen Moore, MS

Fred Prior, PhD

Stanley Phillips

Kirk Smith

**ACRIN Screening Center Staff: Beth Israel Deaconess Medical Center, Boston, Mass**

Principal Investigator

Phillip M. Boiselle, MD

Co-Investigator

Richard Schwartzstein, MD

Physicist

Pei-Jan P. Lin, PhD

CT Manager

Tim A. Parritt

Diagnostic Radiology Manager

Elisabeth A. Grady

Study Coordinator

Lisa Damon, MS

Research Nurses

Sharon Gard, RN

Robin Griggs, RN

Alexis Potemkin, RN

Research Associate

Mary M. Pollock, RN

Research Assistants

Sara Mc Clellan, MA

Melissa Laron, MS

Regulatory Staff

Tamara Owens

**Brigham and Women's Hospital, Boston, Mass**

Principal Investigators

Philip Costello, MD, FACR, FRACR

Francine L. Jacobson, MD, MPH

Philip F. Judy, PhD

Co-Investigators

Andetta R. Hunsaker, MD

Paul W. Spirn, MD

Beatrice Trotman-Dickenson, MD, MBBS

Study Coordinators

Voula E. Christopoulos

Ivana K. Kazda, DDS, MPH

Regina C. MacDougall, RN, BSN, CVN

Annmarie Walsh

Medical Physicist

Richard D. Nawfel, MS

Radiology Technicians

Robert Berger

Pearl Chan

Mark Delano

Jeffrey Geiger

Carl Krinopol

Ann D. McGinnis

Angela M. McLaughlin

Raymond Weatherby

**Brown University, Rhode Island Hospital, Providence, RI**

Site Principal Investigators

Gerald Abbott, MD

Glenn Tung, MD

Co-Investigator

Martha Maineiro, MD

Research Coordinators

Lila Camara

Cindy Cobb

Research Associates

Susan Foley

Elizabeth Morrell

Diane Romano

Secretary

Darlene Guillette

Wendy Smith

**The Cancer Institute of New Jersey, New Brunswick, NJ**

Principal Investigator

Judith K. Amorosa, MD

Co-Investigators

Joseph Aisner, MD  
Murray Backer, MD  
Mark Bramwitt, MD  
Victor de Carvalho, MD  
Robert Epstein, MD  
Peggy Joyce, APN  
John E. Langenfeld, MD  
Ann Reinert, APN

Research Team

Kevin DeMarco, MD  
Stuart Lutzker, MD  
Rita Musanti, APN  
Steven Shiff, MD  
Tammy Wolfsohn, MS

Study Coordinators

Colleen Hudak  
Andrea Hugill, RD  
Marisol Furlong  
Elayne Weslowsky

Laboratory Technicians

Sharon Carmen  
Denise L. Foster  
Kenneth Hansen  
Bernadette Pennetta  
Linda V. White

Medical Physicist

Robert Tokarz, MS, DABR

Regulatory Staff

Maryann Trotta

Recruiter

Ana Birofka

**Dartmouth-Hitchcock Medical Center, Lebanon, NH**

Principal Investigator

William C. Black, MD

Co-Principal Investigators

Claudia J. Kasales, MD

Petra J. Lewis, MB

Physicist

John B. Weaver, PhD

Study Coordinator

Suzanne B. Lenz, MA

Project Assistants

Angelica C. Barrett

Raymond Dauphinais

Jennifer R. Heinz

Matthew K. Siemionko

AmiLyn Taplin

Lisa Scott Wasson, MS

Recruitment

Linda DeAlmeida

Sharon Longacre

Katherine Meagher

Carol M. Moser

Student Assistants

John K. Lawlor, III

Casey O'Quinn

CT Technologists

Nancy E. (Krieger) Black

Heather L. Bradley

Jill K. Bronson

Timothy Cosgrove

Mark K. Haron

Donna King

Pamela M. Mazuerk

Neil F. O'Donnell

Daniel J. Pluta

Terry J. Sackett

Ginette D. Turgeon

Radiologic Technologists

Henry Albano

Courtney Bell  
Jerry Bergen  
Gail Bizer  
Nicole M. Carmichael  
Crista Cimis  
Stephanie Davis  
Tony DeAngelis  
Gail Fellows  
Charlie Fenton  
Joy Ferola  
Nancy Gankiewicz  
Dorothy Hastings  
Chris Howell  
Mary E. Johnson  
Mary Krisk  
Heather Lancor  
Christie Leary  
Maurice LeBlanc  
Adam Leming  
Mandie Leming  
Dawn Mead  
Michael Milacek  
Jamie Mood  
Heidi Nordstrom  
Carolyn Palazzolo  
Jeremy Pierce  
Richard P. Remitz  
Jessica Rider  
Kathleen A. Robbins  
Brenda Sleasman  
Jason Spaulding  
Cam Vashel  
Amie Welch  
Linda White  
Mark Whitty

**Emory University School of Medicine, Atlanta, Ga**

Principal Investigator

Kay H. Vydareny, MD

Clinical Research Coordinator

Angela M. Williams, RN

Physicist

Andrew Karellas, PhD

Research Project Coordinators

Leeta Grayson, MPH

Carlotta McCalister-Cross

Sherri Mesquita, MSW

Anne Nguyen, MPH

Research Interviewer

Laura N. Myers

Data Entry

Eric Deaton

**Jewish Hospital Rudd Heart and Lung Institute, Louisville, Ky**

Principal Investigator

Robert Falk, MD

Site Sub Investigators

Sharon Maxfield, MD

Kevin Thomas

Director, Cancer Services

Laura Brenzel, RN, OCN, MBA

Lead Coordinator

Pamela Allen, RN, CCRP

Research Coordinators

Denise Brooks, RT

Carla Chadwell, RN

Elizabeth Couch

Amanda Devore, MPH

Rubenia Flores, MD

Melba Francis, RN

Sarah Landes, MS

Jacinta Mattingly, RN, OCN

Margaret Oechsli, PhD, CCRP

Bethany Pitino

Shawn Sams, RN

Olga Soukhanova, MD

Data Management Assistants

Priscilla Bland

Sheron Bube

Tricia Hoffa

Becky McElsain

Medical Assistant

Demetria Johnson

Data Abstractors

Cathy Francow

Stephenie Johnson

Pam Senn

**Johns Hopkins University School of Medicine, Baltimore, Md**

Principal Investigator

Elliot K. Fishman, MD, FACR

Sub-Investigators

Karen M. Horton, MD

Leo P. Lawler, MD

Study Managers

Lynne Bradford

Gale Christensen, RN

Research Coordinators

Janet Bishop

Laura Motley

Deborah Robertson

Robin Stewart

Data Support Staff

Carmen Guzman

Physicist

Research Assistants

Heather Bishop Blake

Holly Bradford

Jenna Bradford

James Burner

Jennifer Kasecamp

Jennifer Bishop Kaufmann

Daniel Kimball

Zipporah Lewis

Sheila Moesinger, RN

Susan Walsh, RN

Karen Taylor

Bio Markers

Rex Yung, MD

Mingying Zeng, MD

IT Support Staff

Greg Gambill

Sarah Merrill

Mahadevappa Mahesh, PhD

**Mayo Clinic, Jacksonville, Fla**

Principal Investigator

Barbara McComb, MD

Co-Principal Investigator

Elizabeth A. Johnson, MD

Co-Investigators & Quality Assurance

Howard I. Jolles, MD

Ronald S. Kuzo, MD

Richard L. Morin, PhD

Study Coordinators

Reza Abaya, RN

Deborah Chewar, RN

Patricia Shwartz

Laboratory Technicians

Susan Allen, MT

Shalonda Manning

Pulmonary Technicians

Mary Adams

Zafar Awan

Lisa Beagle

Deanna Cape

Tanya Zeiger

Radiographic Technologists

Laurie Amendolare

Noel Bahr

Minnetta Belyea

Tara Berg

Mia Burkhard

Lisa Cottrell

Katherine DeAngelis

Melanie Dvorak

L. Heather Binnicker Gay

Kelly Hatton

Sharon Jacoby

Valene Kennedy

Kathleen Krach

Melissa Laughren

Cindy Lavergne

Marsha Lawrence

Jeannette Lynch

Amber McDonald

Felix Mestas

Julie Moody

Carrie O'Brien

Janice Pitts

Brenda Polding

Lindsay Richardson

Karen Robinson

Amy Warren

Holly Washburn

Erik Wilson

Luis Zagarra

CT Technologists

Karen Mathews Batton

David Chellini  
Kathleen DeWitt  
Darlene R. Fleming  
Christi Newton-Foster  
Kathleen Krach  
Renee MacDonald  
Carrie O'Brien  
Jennifer Ott  
Julie Peterson  
Michele Sallas  
Michael Teepe  
Rachel Thomas  
Kathy Torrence  
Luis Zagarra  
Coordinator Clinical Radiology  
Jodi Hildestad

**Mayo Clinic, Rochester, Minn**

Principal Investigator

Stephen J. Swensen, MD

Co-Investigators

Thomas E. Hartman, MD

James R. Jett, MD

Cynthia H. McCollough, PhD

David E. Midthun, MD

Study Coordinators

Boleyn R. Andrist

Nancy E. Hanson

Connie L. Sathre

Laura D. Schroeder

Jacqueline R. Sheeran

Lana C. Walters

Other Study Staff

Cynthia L. Andrist

Aaron O. Bungum

Cathy L. Bornhorst

Dawn M. Deno  
Tami S. Krpata  
Ann M. Lambrecht  
Christine M. McKey  
Delores K. Prudoehl  
Helena R. Richter

**Medical University of South Carolina, Charleston, SC**

Principal Investigator

James Ravenel, MD

Co-Principal Investigator

Philip Costello, MD

Study Coordinator

Alan Brisendine

Research Associates

Tricia Adrales-Bentz, MHA, CCRP

Krystal Arnold

Brad Benjamin

Andrew Dodd, MS

John Keller

Tamara Saunders

Paola Spicker, MBA

QC/Internal Auditor

Susan Shannon

Data Entry

Laura Bailey

Hanna Comer

Joy Espiritu, MHA

Stephanie Helwi

Brandy Mack-Pipkin

**Moffitt Cancer Center, Tampa, Fla**

Principal Investigators

Robert Clark, MD

Lynn Coppage, MD

Todd Hazelton, MD

Co-Investigator

Melvin Tockman, MD, PhD

Lead RAs

Beth Evans, RN, CCRC

Nina Wadhwa, MSPH

Study Coordinators

Natalie Baptiste

Courtney Eysmans

Naima Vera-Gonzalez

Data Specialists

Lori Hamm

Veenu Harjani

Anna Sear

Management Assistant

Susan Blackwell, MPH

Laboratory Technicians

Adys Fernandez

Edwin Williams

Medical Physicist

Kenneth A. Coleman, ME, DABMP, DABSNM

Computer Support

Jay Afiat

Regulatory Staff

Lori Kirchoff

Radiology Department Staff

Rob Bowman

Chris Brothers

Barry Cohen

Nicole Fields

Richard Guzman

Celeste Monje

Winston Sterling

Loretta Thorpe

Kevin White

Buddy Williams

**Northwestern University Feinberg School of Medicine, Chicago, Ill**

Principal Investigator

Eric M. Hart, MD

NLST Research Coordinator

Erin Nekervis

NLST Research Associates

Andrea Franco

Irena Glick

Marcello Grigolo

Yassminda Harts

Arthur Migo

Kelli P. Rockwell

Adam Stein

Ryan Weyls, MA

Medical Physicist

Eric Berns, PhD

Technologists

Michelle T. Biringer

Angela Del Pino

Peter Dubbs

Glenna M. Fehrmann

Alan Lee Goodwin

Loretta Granger

Julie Haglage

Jenny Hirschy

Mollie King

Jody Wietharn Kristopher

Nicole Matetic Mac

George Mahoney

Armen Markarian

Martha Ramirez

Michael Taylor

Kelli M. West

**Ochsner Medical Center, New Orleans, La**

Site Principal Investigator

Michael A. Sullivan, MD

Co-Investigator

Charles C. Matthews, MD

Medical Physicist

Jerome Jones, PhD

Study Coordinators

Aura Cole

Pamela Dow, RN

Jacqueline Fearon

Brent Fodera, MS

Barbara Ginther, RN

Rachel L. McCall

Shannon Williams, RT

Serelda Young, RN

Research Assistants

Cristine Juul

Angele LaFleur

Katherine Lohmann

Lisa Pineda

Alison Schmidt

Shannon Wright

Data Entry Staff

Sheila Greenup, RN

Kelly McNulty

Stephanie Pawlak

Heather Porter

Data Support Staff

Teresa Lanning, RN

Debra Loria, RN

**St. Elizabeth Health Center, Youngstown, Ohio**

Principal Investigators

Richard G. Barr, MD, PhD

David Gemmel, PhD

Albert Cook II, MD

Research Secretary

Jo Ann Hallsky

Research Associates

Anthony Boulos

Pritha Dalal

Ben Dickstein

Alice DuChateau, MSN

Catherine Engartner, MSN

Dianalyn M. Evans, BSN

James Evans

Kaylene Evans

Mary Gemmel

Sarah Hallsky

Phil Hoffman

Craig Hritz

Lorraine Kerchum

Mallory Kolich

Mark Kolich

Melody Kolich

Neha Kumar

Judith Lobaugh

Cheryl Love

Dayna Love

Melissa Love

Maria Marchese

Deana Nelson

Carrie Petkus

Marcella Petruzzi, MT

Cristina Raver

Erin Schuler

Patricia Schuler, MSN

David Schultz

Physicist

Robert Kobistek

Laboratory Technicians/Phlobotomists

Jacqueline Jackson

Johanna Ziegler

Respiratory Technicians

Jennifer Fleischer

Linda L. Welch

Radiology Technicians

Marian Acerra

Beverly Brittain

Lisa Conklin

Cindy Cyphert

Brenda Delfosse

Leanne Franceshelli

Joan Fuller

Donna Garland

Peggy J. Gocala

Mauren Grunenwald

Diane Kowalik

Sharon L. Kurjan

Patricia Lavernick

Julie Maderitz

Renee Metz

Roberta Quinn

Marlene Semansky

Stacy Smith

Amy St.Claire

Pamela Taybus

Diana Wisler

Karen Zubena

**University of California at Los Angeles, Los Angeles, Calif**

Principal Investigator

Jonathan G. Goldin, MD, PhD

Co-Principal Investigator

Denise R. Aberle, MD

ACRIN/NLST National Study Coordinator

Catherine Duda, MPH

Nurse Coordinators

Polly Kay, RN

Patty Trapnell, RN

Maria Vlachou, RN

Physicists

Chris Cagnon, PhD

Michael McNitt-Gray, PhD

Administrative Staff

Brandon B. Bigby

Audrey Gallego

Gregg Hamm

Recruiters

Jill Spivak

Maisha Pollard

Staff Research Associates

Eng Brown

Olivia Campa

Barbara Carter

Sonya Clark

Marvin Flores

Judy Ho

Tracy Lee

Barbara Lewis

Janie McMahon

Lea Momongan

Julie Ngo

Adele Perryman

Nicole Rivas

Christina Romo

Kanistha Sookpibal

Lily Stone

Barbara Voight, NP

Carleaner Williams

Data Entry

Kellyn Adams

Phi Do

Kerry Engber

Leslie Henry

Michael Khalili

Sandy Morales

Chelsea O'Carroll

Jade Quijano

Radiology Technologists

Shiva Borgheian

Roger Inatomi

Alfonso Lorenzo

Dinah Lorenzo

Glen Nyborg

Vinis Salazar

Michael Woo

**University of California at San Diego, San Diego, Calif**

Principal Investigator

Eric Goodman, MD

Research Associates

Paige Beck

Paula Beerman

Jean Jacobsen

Administrator

Kathleen Voight

Study Coordinators

Erich Allman

Sabrina Chen

Cristina Farkas

Isabelle Forter

Paul Marcus

Lonna Matthews

Roxana Phillips

Jessica Silva-Gietzen

Erica Sturgeon

Gina Varner

**University of Iowa, Iowa City, Iowa**

Principal Investigator

Geoffrey McLennan, PhD, MBBS, FRACP

Co-Investigators Radiologists

Brian Mullen, MD

William Stanford, MD

Co-Investigator

Eric Hoffman, PhD

Study Coordinator

Kim Sprenger, RN

Research Assistants

Andrea Chapman

Kaylene Crawford

Jacquie Marietta

Leslie Kmetty

Jackie Meier

Phyllis Pirotte, RN, BSN

Laurie Rathmell

Radiology Technologists

Melissa Hudson

Jered Sieren

**University of Michigan Medical Center, Ann Arbor, Mich**

Principal Investigator

Ella Kazerooni, MD

Co-Investigators

Paul Cronin, MD

Barry Gross, MD

Aine Kelly, MD

Smita Patel, MD

Perry Pernicano, MD

Lead Research Assistant

Lisa Holloway

Study Coordinators

Gwen Chalom

Eric Henricks

Jim Pool

Diane Shepherd

Deanna Zapolski

Medical Physicist

Mitch Goodsitt, PhD

Recruiter

Hope Hooks

**University of Pennsylvania School of Medicine, Philadelphia, Pa**

Site Principal Investigator

Drew A. Torigian, MD, MA

Co-Principal Investigator

Warren Gefter, MD

Nurse Research Coordinator

D. Lynn Werner, RN, CCRC

Research Coordinator

Catherine E. Smith

Data Managers

Byung Kun Choi

Joon K. Lee

Research Assistants

Christine Holland

Jacqueline Matuza, MPH

Hilary C. Nosker

Spirometry

William Russell, RPFT

Physicists

Scott Cupp, MBS

Michael O'Shea, PhD

**University of Texas M.D. Anderson Cancer Center, Houston, Tex**

Principal Investigator:

Reginald Munden, MD

Study Coordinators

Melissa Cates

Eric Sanchez

Research Staff

Michelle Aganon-Acheta, RN

Michael Black

Dalphony Blalock, RN

Cynthia Brown, RN

Hattie Cromwell

Joel Dunnington, MD

Jeremy Erasmus, MD

Gregory Gladish, MD

Sanjay Gupta, MD

Michelle Wann Haynes

Thomas Hensley

Revathy B. Iyer, MD

John Madewell, MD

Tamim Malbari

Edith M. Marom

Rodolfo Morice, MD

Sujaya Rao, MS

Bradley Sabloff, MD

Natalie F. Scully, PhD

Sangeeta Tekchandani

Mylene Truong, MD

Danielle Wicks

Physicists

Dianna Cody, PhD

William R. Geiser, MS

CT and radiographic Technicians

Jerry L. Montague

Minesh Patel

Tonda Robinson

**Vanderbilt University School of Medicine, Nashville, Tenn**

Site Principal Investigator

John A. Worrell, MD

Co-Investigators

Edwin F. Donnelly, MD, PhD

Pierre Massion, MD

Research Associate

Elizabeth Thielke, RN, MSN

Research Assistant

Allie M. Bell

Medical Physicist

David R. Pickens, PhD

Assistant Administrative Director, Department of Radiology

Walter Allen Bowman, MA, CRA, RT (R)

CT Senior Specialty Technician

Tina Herron

Chief Technologist, Nuclear Medicine

Dawn Shone

Research Volunteer

Brian Chin, MD

**Wake Forest University School of Medicine, Winston-Salem, NC**

Principal Investigator

Caroline Chiles, MD

Co-Principal Investigator

Michael Chen, MD

Study Coordinators

Lisa Harmon

Lisa Hinshaw, MPH

Carolyn Nelson

Research Associates

Donna Biracree

Denise Boyles

Anne Burrough, MS

Amanda Davis

Elliott Drake

Eileen Frost, MS

Ashley Long

Research Nurses

Elaine Bowman, RN

Susanna Dyer, RN