

Former Worker Medical Screening Program - Development of Low Dose CT Scan Screening Project

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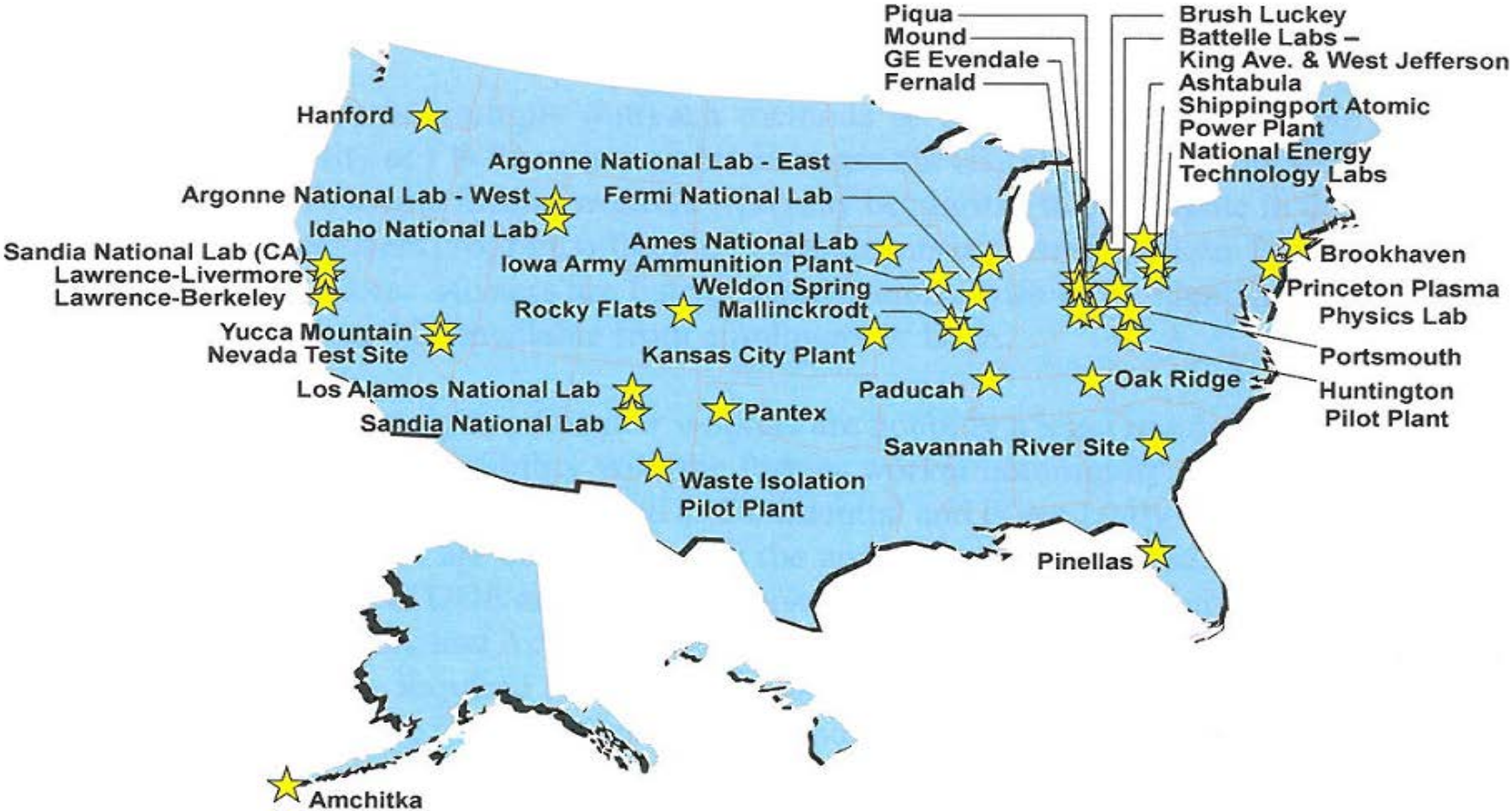
Outline

- **Background of the Former Worker Medical Screening Program (FWP)**
 - The events leading to the FWP
 - What is The University of Iowa College of Public Health doing for the FWP?
- **Breakdown of what I do in the program**
 - Smoking cessation interventions
 - Telephone interviews / database cleaning
- **Conclusions**
- **Future Directions**

Department of Energy- Former Worker Medical Screening Program (DOE-FWP)

- In 1993, Congress passed Public Law 102-484 (Defense Authorization Act)
- Section 3162 required the DOE to evaluate the long-term health conditions of former employees who may be at risk for health problems as a result of their employment at DOE sites
- In 2000, DOE contracted with The University of Iowa College of Public Health, as appointed by Senator Harkin, to implement the FWP medical screenings for the two DOE sites in Iowa:
 - Iowa Army Ammunition Plant (IAAP), near Burlington
 - Ames Laboratory at Iowa State University, Ames (2005)

DOE Facilities Receiving FWP Medical Screenings



Manhattan Project / Ames Laboratory Research

- Intense race to make use of nuclear fission process in WWII
- Manhattan project's Metallurgical lab to lead the research on & to test the first successful chain reaction
- Need for highly purified uranium to test the chain reaction
- In 1942, chemical research to accompany the Manhattan Project's physics program was established at ISU by Frank Spedding and Harley A. Wilhelm

Ames Laboratory

- Over 12,000 employees have ever worked for the Ames Laboratory
- Those who worked prior to 1955 were highly exposed to hazardous substances:
 - Uranium, Thorium, Ionizing radiation
 - Beryllium, Asbestos
 - Metals, Solvents, Noise
- Purified more than 2 million pounds of uranium salt for the Manhattan project until private industry took over the process in 1945
- In 1947, Ames Laboratory was established as an AEC research facility
- Period of pre-OSHA (prior to 1970): lack of personal protection, engineering controls or radiation monitoring to protect employees from exposures and risks
- Ames Laboratory is still in operation today—applied research in chemical, materials, engineering, environmental, mathematical and physical sciences



"A STRIKING ACHIEVEMENT AMONG THE MANY ASSOCIATED WITH THE WARTIME ATOMIC ENERGY PROJECT IN THE UNITED STATES WAS THE PRODUCTION OF MANY TONS OF PURE URANIUM BY A GROUP CONSISTING OF FACULTY AND STUDENTS WORKING IN A DISUSED BUILDING ON THE CAMPUS OF THE IOWA STATE COLLEGE AT AMES."

GLASSSTONE, SOURCEBOOK ON ATOMIC ENERGY

ON THIS SITE BETWEEN 1942 AND 1946 OVER 2,000,000 POUNDS OF URANIUM METAL WERE PRODUCED FOR THE MANHATTAN DISTRICT PROJECT BY D.&F. H. SPEDDING AND ASSOCIATES.



Iowa Army Ammunition Plant (IAAP)

- Located in Middletown, IA- near West Burlington
- 19,000 acre facility which houses a large DOD conventional weapons manufacturing facility and a previously secret atomic bomb assembly plant.
- Produced conventional missile warheads, caliber tank ammunitions, mines, mortars, artillery, demolition charges and weapons' component parts.
- Designed and built between 1941-1943
- Still in operation – current workforce approx. 1,000 employees



DOE Funded Work at IAAP

- Nuclear Weapons assembled, disassembled, modified & tested
 - Department of Energy
 - Burlington Atomic Energy Commission Plant (BAECP)
 - Line 1/Division B
 - 1947 – 1975
 - 1947-1951- the only manufacturer of such a kind in the US
 - 1st Plant in the nation to assemble atomic weapons for the Atomic Energy Commission (AEC)
- Assembly & disassembly of nuclear weapons
 - Intimate contact with:
 - Strong sources of radiation
 - Handling fissile central components of the weapons inches from their bodies without lead aprons
 - ~5,000 workers
 - Production transferred to Pantex Plant, Amarillo, TX in 1975

Former Worker Medical Screening Program

- **Mission:** To identify and locate former DOE employees & provide medical screening tests free of charge
- **Eligible for free medical screening tests:** All production and construction workers who were formerly employed at DOE facilities

Line 1/IAAP

- Production workers
- Guards
- Laundry personnel
- Cafeteria staff
- Tradespersons
- Delivery, storage personnel
- Rail, storage yards
- Burning fields, demolition areas
- Contractors, sub-contractors

Ames Laboratory

- Scientific & technical staff
- Undergraduate & graduate assistants
- Administrative, clerical staff
- Custodians
- Construction workers, sub-contractors

FWP at UI College of Public Health, Department of Occupational & Environmental Health



The University of Iowa
College of Public Health

- Conducts medical screenings, to identify occupational lung disease and radiation-induced cancers, as well as non-occupational health conditions, such as chronic diseases (diabetes, anemia, hypertension, etc.)
- Provides assistance with occupational illness compensation claims



FWP Medical Screening Tests

- **Chest X-Ray**
- **Pulmonary Function Test (PFT) / Spirometry** – a lung function test that evaluates breathing patterns
- **Beryllium Lymphocyte Proliferation Test (BeLPT)** – a blood test that measures sensitization to beryllium, a metal that may have been used in some processes at the IAAP and Ames Laboratory
- **General Lab Tests:** complete blood count, comprehensive metabolic panel, non-fasting total cholesterol, hemoglobin A1c; liver, kidney and thyroid function; urinalysis; Hemoccult blood test

Energy Employees Occupational Illness Compensation Program Act (EEOICPA)

- 2001 Congressional Law
- Provides compensation & medical benefits to former workers who have developed certain occupational lung diseases and radiation-induced cancers
 - \$150,000 lump sum payment plus medical expenses related to accepted occupational illness
 - Up to \$250,000 based on impairment level & wage loss
- UI FWP office helps former workers fill out claim forms. The claims are reviewed and adjudicated by the U.S. Department of Labor.

My Project- Lung Cancer Prevention: Smoking Cessation, LDCT Scan

Goal:

To update participants' records, offer smoking cessation resources to current smokers, and create lists of Line 1/IAAP former workers who are eligible for a new medical screening initiative of providing low dose CT (LDCT) scans to detect early stages of lung cancer

Background, LDCT Scans

- Screening tests to identify lung cancer has been problematic
 - Chest X-ray typically detects malignant lesions too late for curative surgery
- Using computer tomography (CT) to screen for lung cancer has changed this
- Purpose of CT scans: To identify cancer in an individual who does not have symptoms.
- Announced in August 2011, the National Lung Screening Trial (NLST) study found that screening individuals with low dose CT scans reduced mortality by 20% compared to chest X-ray screenings.
- The medical benefits of CT screening for lung cancer were established with sufficient evidence to add this practice to routine clinical care.
- CT screening for lung cancer among high risk individuals (based on age and smoking status) is now recommended by several professional scientific societies (U.S. Preventive Services Task Force, American Lung Association, American Cancer Society, among others)

FWP Early Lung Cancer Detection Program

- Since 2000, the FWP has been pilot testing the feasibility of providing LDCT scans, which was carried out by one FWP office that is administered by Queens College.
- Currently, three FWP offices are providing LDCT scans as a part of their screening panel. The UI FWP office will begin offering LDCT scans in 2014.
- Former workers who are at highest risk for developing lung cancer are offered a LDCT scan, which is based on:
 - age
 - smoking status (pack years)
 - chest X-ray and spirometry results
 - <http://smokingpackyears.com/calculate>

Smoking Pack Years Calculation Website



• <http://smokingpackyears.com/calculate>

Line 1/IAAP, Ames Laboratory Former Workers Potentially Eligible for LDCT

- 528 Line 1/IAAP & Ames Laboratory former workers have been preliminarily identified who are eligible for LDCT. However, vital status, updated smoking history & prior diagnosis of lung cancer still needed to be determined.
- Initially, the 80 former workers who are at the highest risk for developing lung cancer will be contacted about receiving the LDCT scan, based on pack-years of smoking

Eligibility Criteria	Current Age	Obstructive Lung Disease (PFT FEV1 40% Predicted)	Approximate Number Eligible	
			Line 1/IAAP	Ames Lab
Smoking \geq 20 pack-years and <u>no restriction on time since last smoked</u>	50-79	Yes	314	85
CXR with pleural scarring only <u>must meet smoking criteria</u>	50-79	Yes	12	4
CXR Parenchymal (\geq 1/0) even if does not meet smoking criteria	50-79	Yes	53	60
Total Eligible¹			379	149

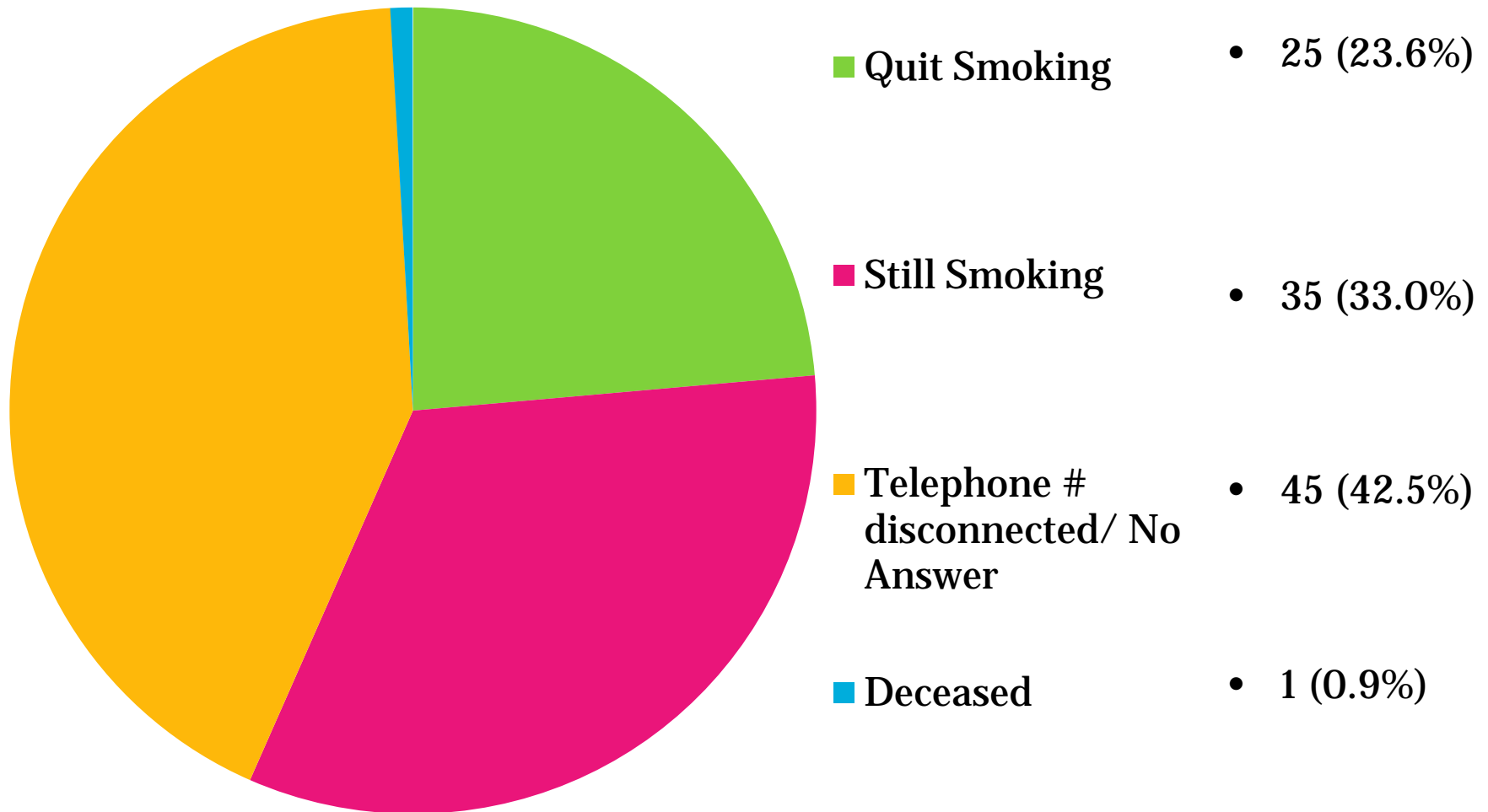
Updated Smoking History

- **Of the 314 Line 1/IAAP heavy smokers who are potentially eligible for receiving a LDCT scan, we needed to review the smoking history and update information for 284 former workers**
- **Received a list of 162 who were smoking at the time of their medical screening to clarify their current smoking status (56 deceased per database records) – called 106:**
 - **Assessed if they quit smoking and when**
 - **Assessed if they are still smoking & how much**
 - **Offered smoking cessation resources**

Smoking Cessation Resources

- **Current smokers, offered to send a packet of smoking cessation resources:**
 - **QuitLine Iowa**
 - **American Cancer Society Brochures – “The Decision Is Yours” & “Set Yourself Free”**
 - **Medications (e.g., Chantix)**
 - **American Cancer Society Packets – “How to Quit Smoking” & “Benefits of Quitting Smoking”**
 - **American Lung Association Packet – “Patches, Gum, Medications and Other Therapies to Help You Quit Smoking”**
- **11 requested resources (31.4%, of the 35 current smokers)**

Line 1/IAAP Smoking Status Interview Results, n=106



Determining Eligibility for LDCT Screenings, Ever Smokers Health Records

- **Cleaned data of all Line 1/IAAP ever smokers (n=386)**
 - **CT scans previously vs. Never had CT scans**
 - **Diagnosed lung cancer/lung diseases vs. Not diagnosed**

Line 1/IAAP Ever Smokers, n=386



■ No CT Scan • 231 (59.8%)

■ CT Scan • 155 (40.2%)



■ No Lung Diseases/
Lung Cancer
Diagnosed • 211 (54.7%)

■ Diagnosed Lung
Diseases/ Lung
Cancer • 175 (45.3%)

Conclusions

- “The CT scan found suspicious nodules on my lungs and the follow-up diagnostic test with my physician confirmed it as cancer. The cancer was found at an early stage and treatment was successful. I am very thankful for the program – if not for the scan, the cancer would probably not have been found until it was too late.”
– Oak Ridge former worker

LDCT Scans- Future Directions

- **Finalize protocols & service agreements for LDCT services**
- **Recruit eligible former workers for LDCT (voluntary screening test)**
- **For abnormal results (e.g., lung cancer, nodules, infections, inflammatory disease), provide follow-up LDCT scans and/or referrals for follow-up medical care.**
- **For normal/negative results, LDCT scans will be offered annually**

Acknowledgements

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- **IBA**