### Firefighter Occupational Exposures (FOX) Project

Rupali Das, MD, MPH
California Department of Public Health
Scientific Guidance Panel Meeting
May 24, 2010
Oakland, California

### • • Overview

- Current project status
- Project design
- Questionnaires and other materials
- Project timeline

## FOX Project - an exposure assessment pilot

#### Collaborators

- Biomonitoring California (CECBP)
- UC Irvine, Center for Occupational and Environmental Health
  - Leslie Israel, DO, MPH
- Orange County Fire Authority (OCFA)
  - Wellness and Fitness (WEFIT) Program
- Funding \$75,000
  - CDC Cooperative Agreement (Year 2)
  - State special fund

### Wellness & Fitness (WEFIT) Program Rowing Away T

#### o Components:

- Wellness and Fitness Medical Evaluation\*
- Peer fitness trainers
- Rehabilitation
- Health and Fitness education
- Oversight Committee
  - Labor-management collaboration
  - Letter of support
- Firefighter liaison: Marty Driscoll



Excess Protein

Quick Healthy

Weak Muscles can lead to Runners Knee....Pg. 5

We're here for you...

WEFIT ange County Fire Authority 1 Fire Authority Road

Irvine, CA

714-573-6836

www.ocfa.org

### Rowing Away The Rainy Day Blues WEFIT Quarterly Newsletter Winter 2010

Spring showers bring May flowers...

A message from the
WEFIT Coordinator

Sputtering New Year's resolutions. Is
your New Year's resolution holding
strong and steady? If not, your WEFIT
program is offering a few ideas to help
you stay on track.

It's about time to start gearing up for the annual "April Rowing Challenge", which will start April 1st and run through the month of April. Participants who row at least 30,000 meters will receive a newly designed T-Shirt. Those who go the extra distance and row over 100,000 meters will be entered in a drawing to win a brand new Concept2 Rower, worth more than an overtime shift!

Looking for more ways to keep yourself energized? Want a little variety in your workout routine? The next WEFIT quarterly class will be a Yoga session, show up for the 90 minute yoga class and take home your own personal yoga mat. Yoga is a great way to improve flexibility and mobility, all you have to do is show up; I guarantee you'll benefit from the class... OR YOUR MONEY BACK!!! Stay tuned for more details.

Did you miss out on the opportunity to come to the last Quarterly Class? Don't fret; keep an eye out, one of the WEFIT program's 35 Peer Fitness Trainers will be bringing the Functional Movement Screen to your station, for your benefit, starting in the month of March. If you're anxious to get started, contact the WEFIT office to schedule an appointment.

In this issue- An in-depth look at yoga, dispelling the myths... A motivational story from one of our own, Fire Prevention Specialist, Teri Merritt. As always, the WEFIT program is here for you, feel free to call or write with any questions, concerns, ideas, or comments. In the meantime... STAY





WEFIT Newsletter

## • • Project Aims

 Assess levels of ~40 chemicals in blood and urine collected from 50-100 firefighters in Orange County, California

 Measure a subset of these chemicals in dust from 3 Orange County fire stations

### • • Project Aims (cont.)

#### Develop and test protocols/procedures applicable to a larger firefighter study

- Recruitment/enrollment
- Exposure assessment questionnaire
- Biospecimen collection/processing/shipping
- Laboratory analyses
- Report results to participants
- Participant response to results
- Lessons may apply to other occupational studies

### • • Chemicals of Interest

Analysis by Environmental Chemistry Lab/DTSC

- Brominated flame retardants (PBDEs, etc.)
- Newer brominated flame retardants (DBDPE, etc.)
- Perfluorinated chemicals (PFCs)
- Polychlorinated biphenyls (PCBs)
- Organochlorine pesticides (DDT, hexachlorocyclohexane, hexachlorobenzene, etc.)

### • • Chemicals of Interest

Analysis by Environmental Health Lab/CDPH

- Metals (Pb, Hg, Cd, As)
- Pesticide metabolites
  - Organophosphates (TCPy)
  - Pyrethroids (3-PBA)
- Polycyclic aromatic hydrocarbon (PAH) metabolite (3-Phen)



- Focus group and individual interviews to evaluate project materials
- o Recruitment/Informed consent/Enrollment
- o Exposure questionnaire
- Biospecimen (blood and urine) collection, processing and shipping
- Biospecimen chemical analysis Biomonitoring California labs

Green = CA special fund Purple = CDC coop agreement

## • • Project Components (cont.)

- o Fire station walk-through with checklist
- Fire station dust collection and analysis
- Data analyses /Report generation
- o Results report-back
  - Online survey to assess understanding

Green = CA special fund Red = In-kind support

#### **Data Collection**

**Field Testing** 

**Firehouses** 

**UC Irvine** 

Results Reporting

Participant Feedback

Firefighter focus groups & interviews

Evaluate study materials

**Test** 

biosample

collection

and handling

protocols

Firehouse dust collections (n=3)

Firehouse exposure source checklist

**Enrollment** 

Blood and urine collection

Exposure assessment questionnaire

Study evaluation questionnaire

Medical record abstraction

6-9 months

Receive some results by mail (metals, nonpersistent chemicals)

Online
survey after
receiving
second set
of test
results

18 months

Receive balance of results by mail (persistent chemicals)

Project staff\*
contact info
provided

**FOX Project Design** 

## Peer Evaluation of Project Materials

#### Focus group discussions or interviews

- Firefighters from Orange County Fire Authority
  - May or may not subsequently become FOX biomonitoring participants
  - Timeline June/July 2010
- Objectives:
  - Review document content and style
  - Evaluate comprehension of test results report-back materials

### Recruit/Consent/Enroll

#### Inclusion criteria

- Firefighter employed by OCFA ≥1 year
- Scheduled for routine Wellness & Fitness (WEFIT) exam September through December 2010

#### Recruitment - flyer

- Electronic reminder for WEFIT appointment
- Fire stations
- OCFA newsletter
- Participants consented & enrolled at beginning of WEFIT appointment

## Project Design: InformedConsent

- Participant is given choice to:
  - Participate in the FOX Project
  - Receive individual results
    - In addition to summary findings
  - Donate unused blood and urine samples along with de-identified personal data for future studies
- Participants will be compensated

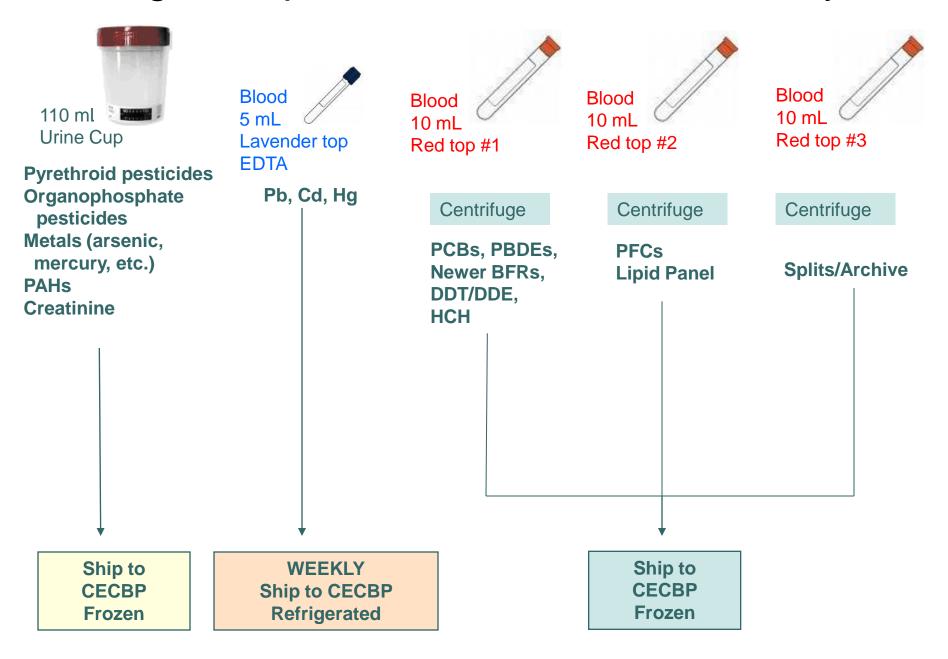
## Exposure Questionnaire

- Purpose identify occupational factors and work behaviors
  - Incident response frequency
  - Incident activities conducted
  - Personal protective equipment use and maintenance

#### o Chemicals targeted:

- Flame retardants
- Perfluorinated chemicals
- PAHs
- Challenge acquire useful data from a 15-minute survey

#### Firefighter Specimen Collection and Analysis



### Critical Values/Follow-Up

#### Comparison with clinical reference values

- Lead: ≥10 ug/dL for adults
- Mercury: to be determined
- Other: to be determined

#### Protocol for follow-up

- Review by UC Irvine or CDPH staff
- Contact participant by phone and mail immediately if needed
- Contact information provided for Dr. Das at CDPH and Dr. Israel at UC Irvine

### • • Fire Station Dust Collection

#### o Purpose:

 Evaluate protocols/procedures for indoor dust collection, processing and analysis as a potential source of persistent chemical exposure



## • • Fire Station Dust Collection

#### o Protocol:

- Select 3 fire stations for sample collection
- Industrial hygiene (IH) walk-through to identify chemical sources
- At each station collect:
  - Vacuum cleaner bag
  - Three hard surface dust samples

## • • Fire Station Dust Collection

#### Analysis of vacuum cleaner bag contents

- PBDEs, PFCs, newer brominated flame retardants, PCBs, organochlorine pesticides
- Metals: lead, mercury, arsenic + 15 others

### • • Fire Station Checklist

- Characterize selected environmental factors in specified fire stations
  - Non-stick cookware (perfluorinated chemicals)
  - Electronic devices, fire vehicles with ripped foam seats, furniture with foam padding, foam pillows, carpeting (flame retardants)
  - Pesticide application in past 30 days
  - Station heating source, number of fire vehicles (PAHs)
- Completed by IH and/or firefighter

## Results Report-Back

- Participants who chose to receive results
- Receive by mail at two time points
  - Up to a year after biospecimen collection
    - Blood and urine metals
    - Nonpersistent chemicals (PAH, OP-specific and pyrethroid pesticide metabolites)
  - Up to two years after biospecimen collection
    - PBDEs, PFCs, organochlorine pesticides
- Participants will be provided contact information for designated UC Irvine and CECBP staff

### Results Interpretation Survey

- Purpose learn what firefighters think of their results, evaluate report-back materials and methods
- Timing after second set of results are returned
- o Plan -
  - 5-minute online survey
  - Monetary incentive

### • • Data Analysis

- Descriptive analyses
  - Presence and distribution of chemical levels measured in firefighters
- Comparisons
  - NHANES data for adults
  - Other studies in adult or occupational groups where data is available
  - California Occupational Blood Lead Registry
  - World Trade Center firefighter study participants
    - Lead, cadmium, PAH metabolite (Edelman et al. 2003)

### **Project Timeline**

May 2010	CDPH/UC Irvine Institutional Review Board (IRB) submissions
	Collect 1st set of firehouse dust samples
June-July 2010	Field test instruments and procedures
Sept 2010	Begin recruitment
Jan 2011	Complete all data and biospecimen collection
Jan 2011	Begin data analysis
Aug-Dec 2011	Return participant lab results #1
Aug-Dec 2012	Return participant lab results #2
Dec 2012+	Prepare project report

### • • Project Staff

- CECBP staff
- Other CDPH staff
  - Lori Copan
  - Dina Dobraca
  - Kate Kelsey
- UC Irvine Center for Occupational & Environmental Health
  - Leslie Israel, DO, MPH
  - Cristina Fan, OHNP
  - Hannah Nguyen
  - Idalia Reynoso

- Orange County Fire Authority/
- WEFIT
  - Marty Driscoll
  - Bob James
  - Joe Kerr
  - Fausto Reyes
- Others
  - Kate Durand, CIH
  - Joe Fedoruk, CIH
  - Elaine Vaughan, PhD

# • • Questions?