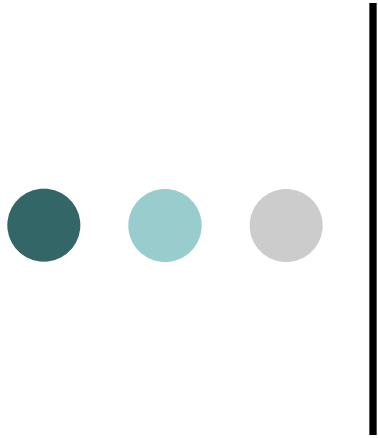


Firefighter Occupational Exposures (FOX) Project



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

- 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

* Performed at UC Irvine

	<h2>Rowing Away The Rainy Day Blues</h2> <h3>WEFIT Quarterly Newsletter</h3> <h4>Winter 2010</h4>	
<h4><u>In this Issue</u></h4>		
A message from the WEFIT Coordinator →	Spring showers bring May flowers... and sometimes the spring brings 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.	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.
Is Yoga right for you?.....Pg. 2	It's about time to start gearing up for the annual "April Rowing Challenge", which will start April 1 st and run through the month of April.	<u>In this issue-</u> 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 PUMPED!!!!
Interview w/ Teri Merritt.....Pg. 3	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!	
Upcoming Announcements.....Pg. 4	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.	
Excess Protein Consumption.....Pg. 4		
Health Facts.....Pg. 4		
Weak Muscles can lead to Runners Knee....Pg. 5		
Quick Healthy Recipes.....Pg. 6		
We're here for you...		
WEFIT Orange County Fire Authority 1 Fire Authority Road Irvine, CA 714-573-6836 www.ocfa.org		
Winter 2010	1	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)



Project Design Components and Funding Sources

- Focus group and individual interviews to evaluate project materials
- Recruitment/Informed consent/Enrollment
- 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.)

- Fire station walk-through with checklist
- Fire station dust collection and analysis
- Data analyses /Report generation
- 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

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)

18 months
Receive balance of results by mail (persistent chemicals)

Project staff* contact info provided

Online survey after receiving second set of test results

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: Informed Consent

- **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
- **Chemicals targeted:**
 - Flame retardants
 - Perfluorinated chemicals
 - PAHs
- **Challenge** - acquire useful data from a 15-minute survey

Firefighter Specimen Collection and Analysis



110 ml
Urine Cup

Pyrethroid pesticides
Organophosphate pesticides
Metals (arsenic, mercury, etc.)
PAHs
Creatinine



Ship to
CECBP
Frozen



Blood
5 mL
Lavender top
EDTA

Pb, Cd, Hg



WEEKLY
Ship to CECBP
Refrigerated



Blood
10 mL
Red top #1

Centrifuge

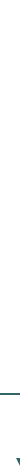
PCBs, PBDEs,
Newer BFRs,
DDT/DDE,
HCH



Blood
10 mL
Red top #2

Centrifuge

PFCs
Lipid Panel



Ship to
CECBP
Frozen



Blood
10 mL
Red top #3

Centrifuge

Splits/Archive





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

○ Purpose:

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





Fire Station Dust Collection

○ 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
- **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 1 st 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

Three colored circles (dark teal, light teal, grey) and a vertical line.

Questions?