Kaiser Permanente Collaboration: Biomonitoring Exposures Study (BEST)

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Scientific Guidance Panel
March 16, 2011
BEST Collaborators and Support

Collaborators

- Biomonitoring California (CECBP)
- Kaiser Permanente Northern California (KPNC), Division of Research, Research Program on Genes, Environment, and Health (RPGEH)
  - Stephen Van Den Eeden, PhD

Funding ~$75,000

- CDC Cooperative Agreement (Year 2)
- In-kind support from Biomonitoring California and KPNC RPGEH
Kaiser Permanente Research Program on Genes, Environment and Health (RPGEH)

- Goal: Build one of the largest and most comprehensive resources in the US for research on genetic and environmental influences on health by linking:
  - Clinical data from electronic medical record
  - Participant survey data
  - Environmental exposure data (questionnaire)

- Biobank
  - 160,000 biological (genetic) samples
  - 400,000 completed questionnaires
Overview of BEST

• Pilot biomonitoring study in California’s Central Valley
• Recruit 100 male and female adults
• Joint recruitment into RPGEH Biobank
• Develop and test protocols/procedures applicable to a larger regional study
Why Collaborate With Kaiser?

SB 1379 requires biomonitoring of a representative population of Californians

Kaiser Permanente membership:
  ● Statewide
  ● Broadly representative & diverse

Expands geographic area of Biomonitoring California participant recruitment
KPNC Members Reside in Urban and Non-urban Locations
KPNC Members Have Wide Variation in Socioeconomic Status
Education Level of KPNC Members Compared to General Population in Northern California

- **Less than high school**
  - General population
  - Kaiser Permanente

- **High school**
  - General population
  - Kaiser Permanente

- **More than high school**
  - General population
  - Kaiser Permanente
Race/Ethnicity of KPNC Members Compared to General Population in Northern California

- White NonHisp %
- Black %
- Hispanic NEC %
- Asian %
- Pacific Islander %
- Native American %
- NEC NonHisp %

NEC: Not elsewhere classified

General population
Kaiser Permanete
Additional Advantages of Collaboration With KPNC RPGEH

Electronic medical records provide rich, comprehensive, continuously updated clinical data

Internal research infrastructure—staff are experienced in working with KPNC members and data

Strong positive (& longitudinal) relationship between KPNC and members
BEST Chemicals of Interest

Brominated flame retardants (BFRs)* (e.g., PBDEs)
Newer BFRs* (e.g., DBDPE)
Environmental phenols (e.g., BPA*)
Metals* (Pb, Hg, Cd, Mn)
Pesticide metabolites (e.g., TCPy, 3-PBA)*
Polycyclic aromatic hydrocarbon (PAH) metabolites (e.g., 3-Phen)

*Focus of the exposure assessment questionnaire
Sampling and Recruitment
Sample Size

- Enroll 100 KPNC members
  - Based on resources
  - First 10 participants: obtain feedback on BEST process and data collection instruments (questionnaires, other forms)
Recruitment

Invite KPNC members to participate
- Mail an introductory letter, postcard, and biomonitoring brochure

Members who do not decline participation
- Follow-up phone call to explain study and arrange field visit
Field Visit

At participant’s home or a Kaiser facility

Consent participants

- Receive individual results
- Donate de-identified blood and urine samples for Biomonitoring California archive

Collect biological samples and questionnaire

Participants receive compensation

- $20 cash card
Exposure Questionnaire

Self-administered

Identify potential home and work exposures

- Occupational exposures
- Diet
- Home furnishings
- Personal care products
BEST Specimen Collection and Analysis

- **110 mL Urine Cup**
  - Pyrethroid pesticides
  - Organophosphate pesticides
  - Metals (e.g., lead, arsenic)
  - PAH
  - Phthalates
  - Creatinine

- **Blood**
  - 5 mL Lavender top
  - EDTA

- **Blood**
  - 10 mL Red top #1

- **Blood**
  - 10 mL Red top #2

- **Blood**
  - 10 mL Red top + 10 mL Yellow top + saliva + urine aliquot

Overnight ship to Kaiser Oakland laboratory on iced gel packs

- Freeze
- Ship to EHL for analysis

- Ship to EHL for analysis

- Ship to EHL for log-in, then transferred to ECL for analysis

- Centrifuge
- Freeze serum

- Kaiser Archive
- Kaiser biobank

- PCBs, BFRs, Newer BFRs, PFCs
- Lipid Panel
Returning Results

Participants receive all results
- In two phases
- Survey participants to evaluate understanding and reactions to results

Select elevated results returned early
- For example: lead, mercury
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<td><strong>Planning</strong></td>
<td><strong>Initial Recruitment</strong></td>
<td><strong>Complete Recruitment</strong></td>
<td><strong>Results Return, Participant Feedback</strong></td>
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<td>CDPH and KPNC Institutional Review Board (IRB) submissions</td>
<td>Mail letter &amp; postcard</td>
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<td>Return first and second set of results</td>
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<td>Randomly select a sample KPNC members</td>
<td>Follow-up phone call &amp; arrange field visit</td>
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<td>Survey participants to evaluate understanding &amp; reactions to results</td>
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<td>Consent &amp; enrollment</td>
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<td>Biological sample &amp; questionnaire collection</td>
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<td>Obtain feedback</td>
<td>Medical record abstraction</td>
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Acknowledgements

Biomonitoring California staff

RPGEH staff

Stephen Van Den Eeden, PhD
Amethyst Leimpeter, MS
Charles Quesenberry, PhD
Questions?