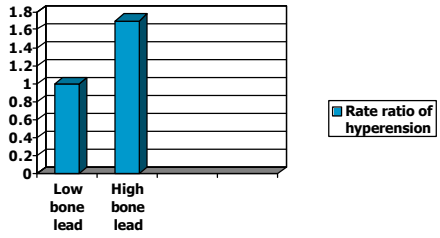
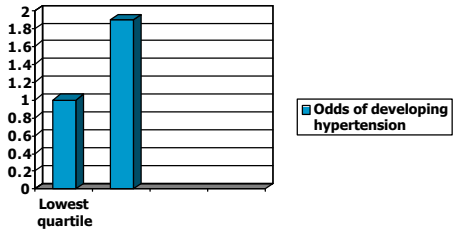
Cheng et al. (Am J Epi, 2001). Bone lead and prospective rate ratio of developing hypertension in the NAS.*



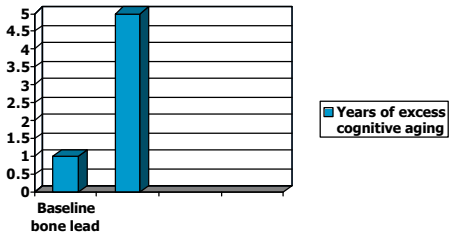
*Adjusting for age, age squared, body mass index, family history of hypertension.

Korrick et al. (Am J Public Health, 1999). Bone lead and hypertension in nurses.*



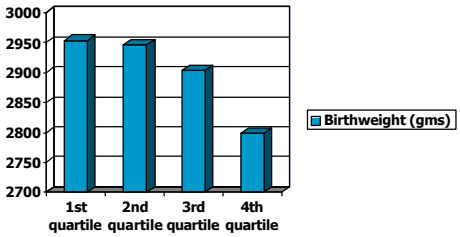
*Adjusted for age, body mass index, family history of hypertension, smoking, alcohol ingestion, dietary sodium, dietary calcium

Key studies of lead and cognition: Schwartz et al. (Neurology, 2000). Bone lead and cognitive declines in former lead workers.*



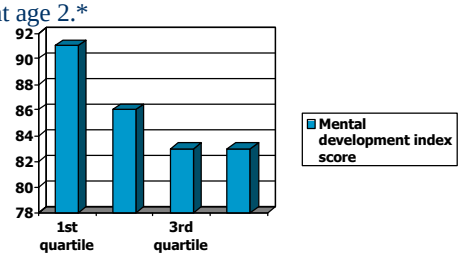
*+16 µg/g bone mineral, adjusted for education, socioeconomic status.

Key studies: reproductive risks: Gonzalez-Cossio et al. (Pediatrics, 1997). Bone lead and birth weight in 272 mothers in Mexico.*



*Adjusted for gestational age, parity, smoking, maternal calf circumference, education

Gomaa et al. (Pediatrics, 2002). Maternal bone lead as a predictor of IQ (Bayley scales) at age 2.*



*Adjusted for maternal age, IQ, gender, maternal education, paternal education, parental marital status, breast feeding duration, cord blood lead.

Current Draft: Main Conclusions

- Prevention should remain the primary goal
- Biological monitoring should consider cumulative lead exposure as well as acute lead exposure
- Cumulative lead exposure at blood lead levels well below 40 µg/dL are associated with
  - elevated risk of hypertension;
  - cognitive dysfunction and accelerated declines;
  - several reproductive risks;
  - *possibly* renal dysfunction

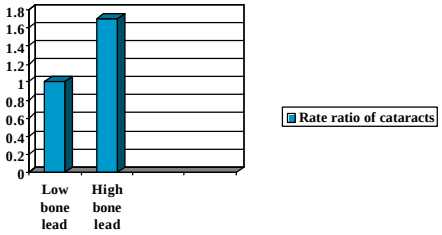
Main conclusions (continued)

- Over short time periods, blood lead levels should be kept <??? 20 ??? µg/dL to prevent *acute* effects
  - *In pregnant women: <??? 5 µg/dL ???*
- Over longer time periods, cumulative lead dose should be limited to prevent *chronic* effects
  - KXRF-measured tibia lead <??? 15??? µg/g bone
    - Problems: Only 5 facilities exist in U.S. for measuring bone lead levels; no NIST-approved inter-calibration standardization protocols yet
  - Calculate cumulative blood lead index (CBLI) and keep <??? 200??? µg-years/dL
- *THESE RECOMMENDATIONS WILL BE COMING SOON…*

Main conclusions (continued)

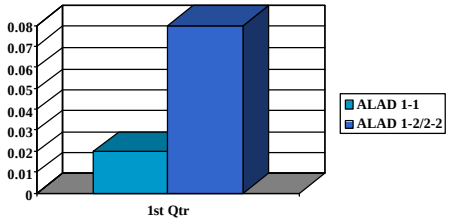
- Chelation decisions need to be individualized (unclear b/o lack of appropriate studies). In general:
  - Consider if blood lead 40-79 µg/dL and sx
  - Strongly consider if blood lead >80 µg/dL
- Current OSHA lead standard not protective
- Additional research needed to:
  - fully confirm findings of recent studies on cumulative dose-chronic health effects;
  - identify vulnerable sub-populations (e.g., diabetics, genetic polymorphisms);
  - clarify role of chelation
- Report to be published in major journal
- *A MINORITY DISSENTING OPINION IS LIKELY FROM INDUSTRY REPS*

Schaumberg et al. (JAMA, in press). Bone lead and risk of developing cataracts in the Normative Aging Study.*



*Adjusting for age, smoking

Wu et al., (EHP, 2003). Increase in serum creatinine (mg/dL) assoc. with bone lead of 40 µg/g, stratified by ALAD genotype*



*Adjusting for age, BMI, hypertension, alcohol consumption, current smoking, analgesic meds; interaction p-value=0.025

For New Engl. OEM Clinicians:

- Good on-line information resource
  - Massachusetts Lead Registry and Program
    - Current medical guidelines:
      - http://www.mass.gov/dos/leaddocs/lead_med_guide.htm
    - Other information on training, regulations, etc:
      - http://www.mass.gov/dos/lead/index.htm
- Latest research: Metals Epidemiology Research Group website
  - http://www.hsph.harvard.edu/merg/
- Clinical referrals: The academic OEM clinics of the Harvard School of Public Health
  - Cambridge Hospital, Cambridge, MA (Dr. Goldman)
  - Northeast Specialty Hospital, Braintree, MA (Dr. Hu)
    - Metals toxicity specialization
    - Access to K-XRF (Dr. Hu's research laboratory at the Brigham and Women's Hospital/Harvard)