

CATALYST RESEARCH STUDY: CUMULATIVE BONE LEAD, MENTAL HEALTH, AND FIREARM OWNERSHIP AMONG VETERANS AND ACTIVE- DUTY SERVICEMEMBERS SEEKING CARE AT HOME BASE

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A RED SOX FOUNDATION AND
MASSACHUSETTS GENERAL HOSPITAL PROGRAM



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DISCLOSURE

- Neither I nor my spouse/partner has a relevant financial relationship with a commercial interest to disclose.

OVERVIEW

Veterans and active-duty service members are at risk of lead exposure, PTSD, related depression and suicidal ideation.

- Also at great risk of Firearm-Related Lead Exposure
- Majority of suicides completed with firearms

Most studies investigating lead exposure are only able to capture 35-day exposure window via blood

National Health and Nutrition Examination Survey (NHANES) results found significant associations between firearm use, military status, and blood lead levels

Lead deposits in the bone and can be captured via X-Ray Fluorescence (30-45 years)



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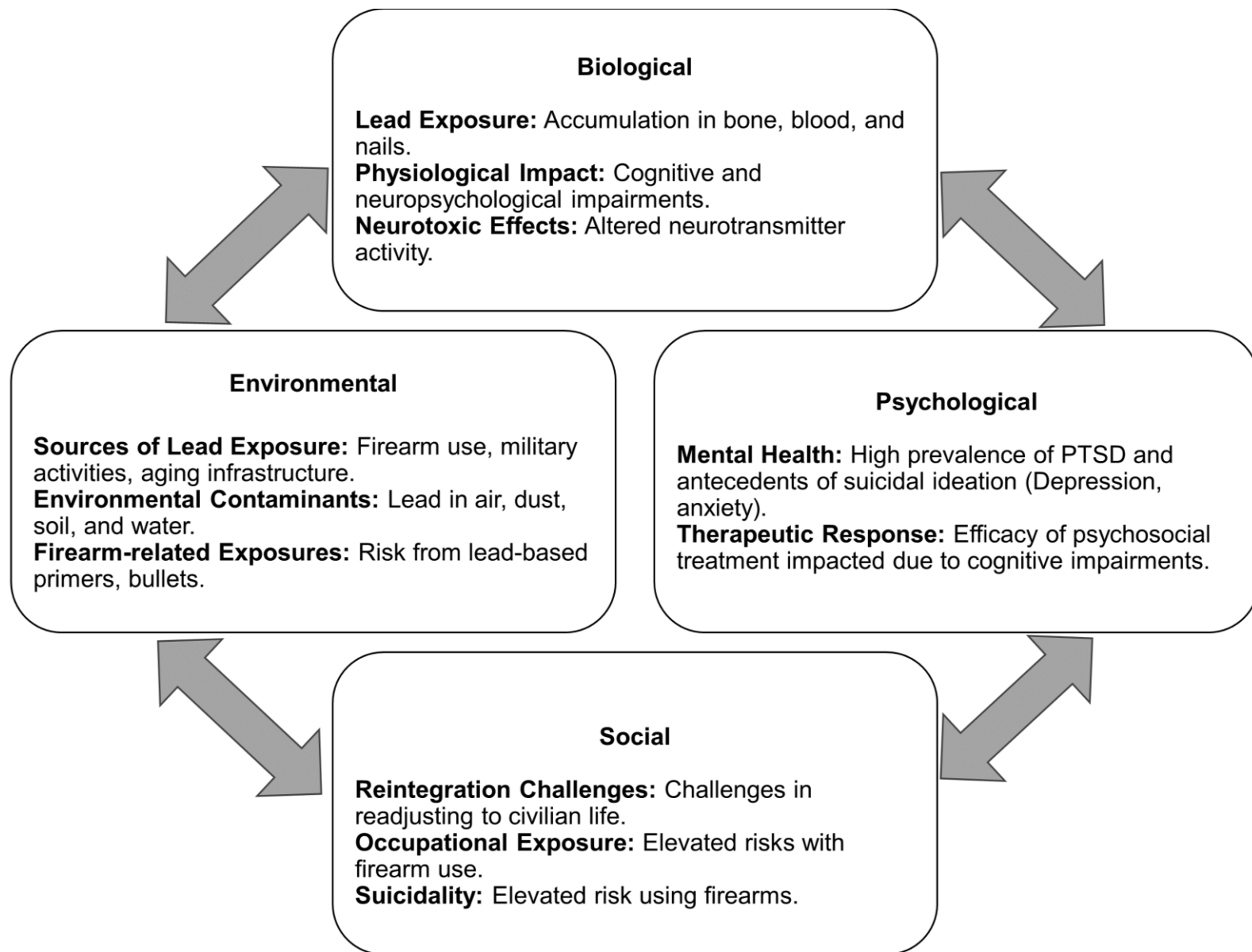
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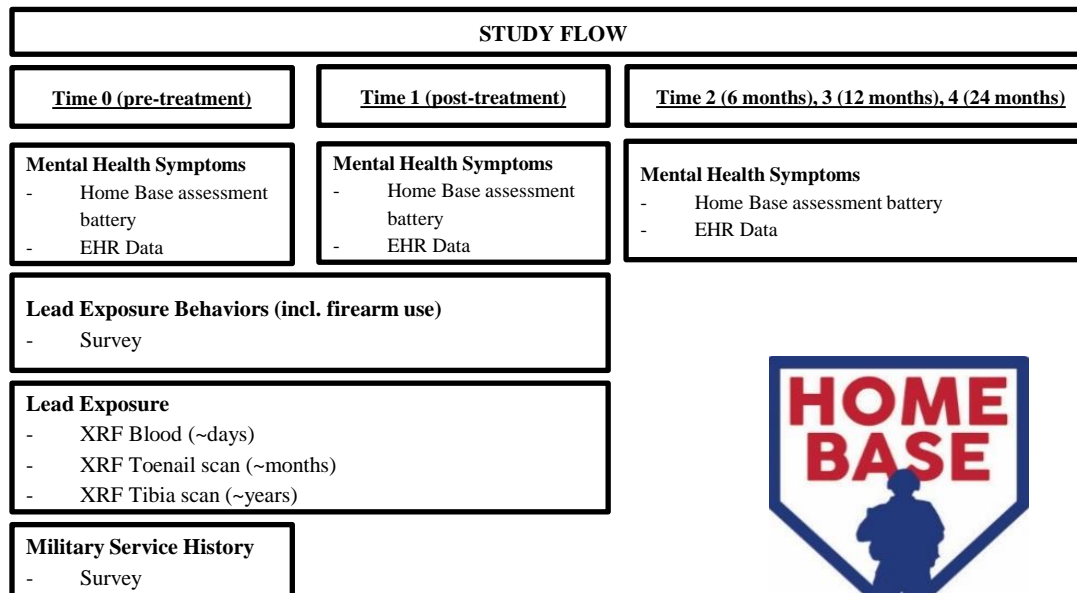
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OVERVIEW

Study Goal: Understand the relationship between cumulative bone lead, PTSD, depression, and suicidal ideation, considering historic and current lead exposure risks via firearms and occupations

Study design: Prospective Cohort of 350 Veterans and Active-Duty Servicemembers.



CURRENT STUDY STATUS

(AS OF 8/12/24)

- 290 participants
 - Expanded our recruitment target 2x (lowered compensation 2x) to accommodate level of interest and rate of recruitment!
 - Indicates level of interest that participants have in their exposure risk/levels
- R01 submitted on 6/1 seeking further funding and with additional study goals:
 - Analyze blood and nail samples
 - Complete EHR data collection
 - Enhance our report back procedure (using DERBI)
 - Examine impact of exposure on treatment outcomes
- After recruitment completes, participants will receive information about their cumulative bone lead results relative to others in the study
 - 100% of participants reported being interested in receiving these results
 - Also indicates level of interest in this topic!

Variable (N)					
Age (290)	Mean=44.1	SD=9.4			
Gender (275)	Male=221 (76.2%)	Female=54 (18.6%)			
Race (276)	White=202 (69.7%)	Black or African American=20 (6.9%)	Asian=11 (3.8%)	American Indian or Alaska Native=4 (1.4%)	Native Hawaiian or other PI=8 (2.8%)
Ethnicity (274)	Non-Hispanic/Latino=233 (80.3%)	Hispanic/Latino=41 (14.1%)			
Relationship Status (276)	Married/domestic partnership=163 (56.2%)	Divorced=37(12.8%)	Single=31 (10.7%)	Separated=31 (10.7%)	
Sexual Orientation (274)	Heterosexual=259 (89.3%)	Lesbian=4 (1.4%)	Gay=1 (.3%)	Bisexual=3 (1%)	
Cumulative Bone Lead (290)	Mean=6.2ug/g	SD=8.8			

COMPARISON BONE LEAD LEVELS

Bone lead in adults from a 2017 general population study in Toronto showed a level on average of about 3.4 $\mu\text{g/g}$ for those with average age of 43, 0.9 $\mu\text{g/g}$ for those with average age of 29, and 6.0 $\mu\text{g/g}$ for those with average age of 56.5.

Our study has an average age of 44.1 and average bone lead level of 6.2 $\mu\text{g/g}$.



McNeill FE, Fisher M, Chettle DR, Inskip M, Healey N, Bray R, Webber CE, Manton WI, Marro L, Arbuckle TE. The decrease in population bone lead levels in Canada between 1993 and 2010 as assessed by in vivo XRF. *Physiol Meas*. 2017 Dec 28;39(1):015005. doi: 10.1088/1361-6579/aa904f. PMID: 28967867.

Thank you for your attention!

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