

# **A NESTED CASE-CONTROL STUDY OF RESIDENTIAL and PERSONAL MAGNETIC FIELD MEASURES and MISCARRIAGES**

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**Abstract:** We conducted a nested case-control study (177 cases, 550 controls) to assess the relation between retrospective magnetic field measures and clinical miscarriage among members of the northern California Kaiser Permanente medical care system. We also conducted a prospective substudy of 219 participants of the same parent cohort to determine whether 12-week and 30-week exposure assessments were similar. We evaluated wire codes, area measures, and three personal meter metrics: (1) the average difference between consecutive levels (a rate-of-change metric), (2) the maximum level, and (3) the time-weighted average. For wire codes and area measures we found little association. For the personal metrics (30 weeks after last menstrual period), we found positive associations. Each exposure was divided into quartiles, with the lowest quartile as referent. Starting with the highest quartile, adjusted odds ratios and 95% confidence intervals were 3.1 (95% CI= 1.6 – 6.0), 2.3 (95% CI = 1.2 – 4.4), and 1.5 (95% CI = 0.8 – 3.1) for the rate-of-change metric; 2.3 (95% CI = 1.2 – 4.4), 1.9 (95% CI = 1.0 – 3.5), and 1.4 (95% CI= 0.7 – 2.8) for the maximum value; and 1.7 (95% CI = 0.9 – 3.3), 1.7 (95% CI = 0.9 – 3.3), and 1.7 (95% CI = 0.9 – 3.3) for the time-weighted average. The odds ratio conveyed by being above a 24-hour time-weighted average of 2 milligauss was 1.0 (95% CI = 0.5 – 2.1). Exposure assessment measurements at 12 weeks were poorly correlated with those taken at 30 weeks. Nonetheless, the prospective substudy results regarding miscarriage risk were consistent with the nested study results.

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