From: Bollweg, George
To: Rosemarie Bowler
Cc: Lobdell, Danelle
Subject: some Ohio Mn study questions
Date: Thursday, September 05, 2013 1:44:53 PM

Hi Rosemarie – I was asked to briefly discuss the July 2013 Ohio Mn preliminary results with another USEPA office (OAQPS) next week. Before doing so I have a few questions (below) about the July fact sheet on the EPA website. To avoid excess email, I'll call you to discuss this. I may also use slide 12 from your Cape Town presentation ("Neuropsychological Test Battery") that matches neuropsych function and tests evaluating that function.

I'll try reaching you soon to discuss this. thanks, George B.

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9/5/13
Questions for RB regarding OH Airborne Mn Study – July 2013 fact sheet (from http://www.epa.gov/nheerl/mnstudy)

The National Institute of Neurological Disorders and Stroke website states "…The four primary symptoms of PD [Parkinson's Disease] are **tremor**, or trembling in hands, arms, legs, jaw, and face; **rigidity**, or stiffness of the limbs and trunk; **bradykinesia**, or slowness of movement; and **postural instability**, or impaired balance and coordination." (http://www.ninds.nih.gov/disorders/parkinsons_disease/parkinsons_disease.htm)

The July 2013 "Health Study of Airborne Manganese Exposure in East Liverpool, Marietta and Mt. Vernon, Ohio" fact sheet states (under Preliminary Results, Neurological assessment, p. 3):

- East Liverpool residents showed slower movement initiation (results in delays in onset of movement) than Mount Vernon residents, but were slightly better than Marietta residents.
- More hand tremors (involuntary shaking) were observed in East Liverpool residents than Marietta residents.
- East Liverpool residents had more postural sway/instability (involuntary swaying or instability when standing on both feet) than Marietta and Mount Vernon

Q1. Are bradykinesia ("slowness of movement" per NINDS website) and "slower movement initiation" (as observed in EL residents) the same thing or different?

Q2. Was "slowness of movement" or "slower movement initiation" evaluated by clinical judgment alone, or was there a functional (neuropsych test) that also addressed this symptom?

Q3. If the answer to Q1 above is "yes", the exacerbation of 3 of 4 primary Parkinson Disease symptoms in EL residents (bullet points above) seems a very strong finding. Is this an appropriate interpretation of the preliminary results? This raises the question of whether there's a neuropsych test (I assume there are clinical criteria) for rigidity, and if so, why that test wasn't used (i.e. if it

could have shown “4 of 4”).

Q4. Fact Sheet p. 2: “Researchers randomly selected (when possible) adults in each of the three communities…” What does “when possible” mean?