Interpreter Errors and Their Potential Medical Consequences

**Title**: Errors of Medical Interpretation and Their Potential Clinical Consequences: A Comparison of Professional Versus Ad Hoc Versus No Interpreters

**Authors**: G Flores, M Abreu, CP Barone, R Bachur, H Lin

**Source**: Annals of Emergency Medicine, March 2012

Recent studies have shown fewer errors and less likelihood of clinical consequences when limited English proficient patients have access to trained professional interpreters. In this study, the authors compare interpreter errors and their potential clinical consequences in hospital pediatric encounters using professional interpreters versus ad hoc interpreters versus no interpreters. The study also analyzes whether, among professional interpreters, hours of previous interpretation training or years of experience are associated with error numbers, types of errors, and potential clinical consequences.

Researchers audiotaped encounters between physicians and families in the two largest pediatric emergency departments in Massachusetts. To be eligible for the study, the child’s principal caretaker had to identify Spanish as the primary language spoken at home and had to have limited English proficiency. Researchers sampled pediatric emergency departments on weekdays and weekends for 30 months. From the audiotaped encounters, bilingual verbatim transcripts were prepared by professional transcriptionists fluent in English and Spanish. The researchers classified interpreters as (1) professional interpreters, who receive financial compensation and are employed by the hospital’s interpreter services department; (2) ad hoc interpreters, including family, friends, nonclinical hospital employees, strangers from waiting rooms, and hospital clinical staff who had no formal medical interpreter training or screening; and (3) no interpreter, defined as encounters with no professional or ad hoc interpreter present. In addition, the researchers used five categories to classify interpreter errors: omission, addition, substitution, editorialization, and false fluency. Deviations from the original literal interpretation due to jargon, idioms, contextual clarification, or cultural explanation were not classified as errors.

This study examined a total of 57 encounters. Of these encounters, 20 were professional interpreters (35%); 27 were ad hoc interpreters (47%); and 10 were no interpreter (18%). The study found a total of 1,884 interpreter errors in the 57 encounters, with a mean of 33 errors per encounter and a range of 2 to 246 errors per encounter. Although the differences in mean errors per encounter by
interpreter category were not statistically significant, the proportion of errors that had potential clinical consequence was significantly lower for professional interpreters than for ad hoc or no interpreter (12% versus 22% and 20%, respectively). The study also found that a total of 344 errors (18%) had potential clinical consequences. The most common category of errors was omission which accounted for 47% of all errors, followed by false fluency (26%), addition (10%), editorialization (9%), and substitution (9%). Among professional hospital interpreters, hours of previous training, but not years of experience, are significantly associated with the number and types of errors and their clinical consequences.

While there are limitations to the study, this is the first study to include encounters with no interpreters and is the largest sample to date to examine interpreter errors. The results further indicate that ad hoc interpreters and no interpreters are suboptimal for limited English proficient patients. The authors stress the need for third-party reimbursement for interpreter services, which has been shown to result in greater use of professional interpreters. Given the study’s findings, the authors also recommend requiring at least 100 hours of training for interpreters to reduce interpreter errors and improve the health and safety of patients.

Exposure to Inhalable Airborne Dust Among Grain Elevator, Cattle Feedlot, Corn Farm, and Dairy Workers

**Title:** Pulmonary Function Reductions Among Potentially Susceptible Subgroups of Agricultural Workers in Colorado and Nebraska

**Authors:** SJ Reynolds, ML Clark, N Koehncke, S von Essen, L Prinz, TJ Keefe, J Mehaffy, M Bradford, B Cranmer, ME Davidson, IV Yang, JB Burch

**Source:** Journal of Occupational and Environmental Medicine, Vol. 54 Issue 5, May 2012

The authors of this study noted that agricultural workers are at increased risk of respiratory morbidity and mortality. Of particular concern, inhalation of organic dusts in the agricultural environment has been associated with adverse respiratory responses including acute organic dust toxic syndrome, chronic asthma and asthma-like syndrome, and chronic obstructive airway disease. This study quantifies personal exposure to inhalable airborne dust among grain elevator, cattle feedlot, corn farm, and dairy workers.

174 workers from 26 worksites participated in this study. Among these workers, researchers evaluated the relationship between dust/endotoxin exposures and cross-shift pulmonary function changes in 137 male workers. The majority of the 137 participants, who ranged in age from 18 to 72 years old, worked in grain elevators (38.7%) or cattle feedlots (43.8%), and their ages ranged from 18 to 72 years.

The study results show that geometric mean dust levels were similar among feedlot (2.66 mg/m³), dairy (2.37 mg/m³), and farm (2.86 mg/m³) employees and were elevated for grain operators (5.09 mg/m³). The authors found that although the geometric mean exposures were generally low relative to proposed occupational guidelines for dust and endotoxin in livestock environments, a significant number of participants experienced very high exposure levels.
The authors also identified several environmental factors that may increase susceptibility to agricultural dust exposures. The authors found greater exposure-associated reductions in lung function among current smokers than nonsmokers and those reporting pesticide and herbicide application than those not reporting application. A growing body of evidence also suggests that obesity may exacerbate the effect of inhaled air pollutants. Based on the author’s review of current literature, this study is the first human study to observe dust-induced reduction in lung function among pesticide applicators.

Some of the noted limitations in this study include a small sample size and the low response rate of agricultural workers solicited for participation (~50%). The most common reasons for nonparticipation were fear of getting blood drawn and immigration status. The authors recommend comprehensive wellness programs that address obesity and smoking, in addition to dust exposure reduction strategies as possible interventions for agricultural workers.

Organophosphorus Pesticide Urinary Metabolite Levels in 6-, 12-, and 24-Month Old Children in Salinas Valley, CA

Title: Determinants of Organophosphorus Pesticide Urinary Metabolite Levels in Young Children Living in an Agricultural Community
Authors: A Bradman, R Castorina, DB Barr, J Chevrier, ME Harnley, EA Eisen, TA McKone, K Harley, N Holland, B Eskenazi

After the 1993 publication of “Pesticides in the Diets of Infants and Children,” public health concerns about pesticide exposure to young children have received increased attention. Since then, biomonitoring studies have confirmed that children are widely exposed to pesticides, including organophosphates and fungicides.

In this study, the authors measure six organophosphorus dialkylphosphate (DAP) metabolites (three dimethyl alkylphosphates (DMAP) and three diethyl alkylphosphates (DEAP)) in urine samples collected from ~ 400 children living in Salinas Valley when they were 6, 12, and 24 months old. The authors examined potential determinants of exposure associated with organophosphorus urinary metabolic levels at each age point, including sex, child behavior, diet, home pesticides use, season, parental work status, and proximity of homes to fields.

The center of the Health Assessment of Mothers and Children of Salinas (CHAMACOS) is a longitudinal cohort study investigating environmental exposures and health of pregnant women and their children in the Salinas Valley. Between October 1999 and November 2000, 601 pregnant women were enrolled in the CHAMACOS birth cohort study, resulting in 538 live births. Of these live births, the authors collected urine samples from 97% of children at 6 months, 92% of children at 12 months, and 92% of children at 24 months of age.

In addition to the urine samples, the authors interviewed the mothers and conducted home inspections when the children were 6, 12, and 24 months old. In this study, 15% of mothers were employed as agricultural workers, and 66%
percent shared a home with at least one agricultural worker. In addition, 66% of mothers were living at or below the U.S. federal poverty threshold when the children were 6 months old.

The authors found that all children had detectable levels of organophosphorus metabolites in their urine. They also observed three-fold higher DMAP levels in 24-month olds and two-fold higher levels in 12-month olds relative to 6-month olds, while DEAP levels declined between 12 and 24 months. The authors suggest that the increase in DMAP levels may be due to increasing exposure-related behaviors and changes in diet as the children age. The study did not find consistent associations across age points, or between DMAP and DEAP metabolites in agricultural-related determinants of pesticide exposure (e.g., homes proximity to the field). However, the authors did observe that the intake of fruits and vegetables was consistently and positively associated with both classes of urinary metabolites in children of all ages, and was statistically significant for DMAP metabolites in 6- and 12-month old children. Given the health benefits of fresh fruits and vegetables, the authors do not suggest that children limit intake of these foods but encourage washing of all produce before consumption.

In conclusion, the authors found that children living in agricultural areas are likely exposed to organophosphorus pesticides from multiple pathways. They emphasize the need for additional research to better explain the trend of increasing organophosphorus urinary metabolites with age and the dietary, behavioral, and other factors that determine exposure.

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**HIV Infection Rates and Behavior Risks Among Deported Labor Migrants in Tijuana, Mexico**

*Title: A Two-Way Road: Rates of HIV Infection and Behavioral Risk Factors Among Deported Mexican Labor Migrants*

*Authors: MG Rangel, AP Martinez-Donate, MF Hovell, CL Sipan, JA Zellner, E Gonzalez-Fagoaga, et al.*

*Source: Aids and Behavior, May 2012*

Every year, approximately half a million Mexican migrant workers are apprehended and deported to Mexican cities along the US-Mexico border. The authors’ literature review found that migration has been identified as a structural factor associated with increases in HIV incidence. In this study, the authors examine the prevalence of HIV infection, behavioral risk factors for HIV and other STIs, and access to HIV/STI testing and treatment services among a large, population-based sample of deported Mexican migrant workers.

From August to November 2009, the researchers conducted a population-based survey among deported migrant workers in Tijuana, Mexico. The Tijuana border region accounts for 22% of all U.S. Border Patrol apprehensions and 40% of all deportations to the Mexican border region. Recruitment and data collection took place in the area immediately outside the only operating deportation facility in Tijuana. In this study, eligible individuals were 18 years or older, born in Latin America, returned to Mexico by U.S. immigration authorities, fluent in Spanish, and had no history of previous participation in the survey. The researchers approached 775 individuals as they exited the deportation facility. Of them, 705
answered the screening survey, 702 met eligibility criteria, and 693 agreed to participate in the survey.

The study sample represented a weighted population of 36,971 males and 3,494 females deported to Tijuana during the study period. The authors found that the deported workers were mostly males (91.4%) and that the majority of the males (72.3%) and more than half of the females (53.9%) had been employed full time while in the U.S. Of those employed full time, 15% of the males and 19.8% of the women were employed in the agriculture/landscaping sector. Most deported migrants did not have health insurance in the U.S. during the last 12 months (73% of males and 65.7% of females).

The authors found common behavioral risk factors, particularly among men. These risk factors include: multiple sex partners in the last 12-months (37.2% of males; 17% of females), unprotected vaginal or anal sex (62.6% of males; 67.5% of females), sex with casual partners (27% of males; 12.7% females), and sex with sex workers (9.4% of males; 0.8% of females). The study also found that lifetime rates of HIV testing were 51.1% and 54.3% for male and female deportees, respectively. Approximately 19.4% of deported males and 11.2% of deported females had been tested for HIV in the U.S. The authors found 1.15% of tested participants and 0.73% of the corresponding weighted population were HIV positive. For males, the sample and population estimated rates of HIV were 1.23% and 0.8%, respectively. No positive cases were found among females.

The prevalence of HIV infection among deported males (0.8%) is more than twice that estimated for the male adult population in Mexico (0.3%) and above rates of male HIV infection in the U.S. (0.7%). The authors conclude by recommending an expansion of current HIV program to ensure continuity of HIV prevention and treatment among unauthorized Mexican migrants in the U.S. and migrant deportees in the northern border of Mexico.

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**Farmworker Gender Discrepancies in Acute Pesticide-Related Illnesses and Injuries**

**Title:** Gender Differences in Acute Pesticide-Related Illnesses and Injuries Among Farmworkers in the United States, 1998-2007  
**Authors:** EJ Kasner, JM Keralis, L Mehler, J Beckman, J Bonnar-Prado, SJ Lee, B Diebolt-Brown, P Mulay, M Lackovic, J Waltz, A Schwartz, Y Mitchell, S Moraga-McHaley, R Roisman, R Gergely, GM Calvert  
**Source:** American Journal of Industrial Medicine, Vol. 55 Issue 7, July 2012

In the U.S., approximately 80% of pesticides are used in agriculture. Farmworkers can be exposed to pesticides by mixing, loading, and applying them, by performing duties that bring them in contact with pesticide-treated materials, or by drift of pesticides applied to nearby areas. In a recent analysis of data highlighted in this study, the California Department of Pesticides Regulation (CDPR) found that the incidence rates of acute pesticide-related illness among all females in the agricultural industry were approximately twice as high as those of males.

In this study, the authors analyze data to explore factors that may explain the discrepancy in incidence rates between male and female farmworkers. The authors
identified acute pesticide-relate illness and injury cases among farmworkers from the Sentinel Event Notification System for Occupational Risks Pesticides Program (SENSOR), the National Agricultural Worker Survey (NAWS), and the CDPR. The study also assessed gender-specific associations with acute pesticide-related illness and injury.

From 1998 to 2007, the authors identified 2,534 cases of acute pesticide illness and injury among farmworkers, of whom 1,777 were male and 757 were female. The data analyzed by the authors showed that the incidence rate of acute pesticide-related illness is twice as high among female farmworkers compared to their male counterparts. Based on national demographic estimates from NAWS, while only 23% of all those employed as non-handler farmworkers are female, they represent 39% of the non-handler farmworkers affected by pesticides. In the analysis, the study showed that affected female non-handler farmworkers were more likely to be working on fruit and nut crops, exposed by drift from the application site, and exposed to fungicides and fumigants compared to affected male non-handler farmworkers.

The authors suggest that the type of work done by females may account for the different patterns of exposure. For instance, females are less likely to operate machinery and are more likely to be involved with cutting, sorting, and harvesting crops. Another possibility for the discrepancy in the incidence rate is the higher reporting rates of pesticide-related illnesses and injuries among female workers.

In conclusion, the authors recommend measures that would mitigate pesticide drift, the most common type of exposure for both male and female farmworkers found in this study. Such measures include using equipment with new validated drift reduction technologies, as they become available. The authors also call for improved compliance and enforcement of existing pesticide regulations to prevent cases of acute pesticide illness and injury among farmworkers.

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**The Role of Stress in Predicting Change in Cognitive Function in Latino Farmworkers**

**Title:** Stress and Cognitive Function in Latino Farmworkers  
**Authors:** HT Nguyen, SA Quandt, JG Grzywacz, H Chen, L Galvan, MH Kitner-Triolo, TA Arcury  
**Source:** American Journal of Industrial Medicine, Vol. 55 Issue 7, March 2012

Stress in farmworkers has emerged as an important public health concern, with nearly 40% of farmworkers studied having significant levels of stress. Farmworkers face numerous stressors, including occupational hazards, poverty, nature of rural life and social isolation, health and safety concerns, and separation from family. Given that stress has been documented to have deleterious cognitive effects on the brain, inherent stressors in migrant agricultural work can lead to poor work performance and even injury.

In this study, the authors examined the role of stress in predicting change in cognitive function over an agricultural season in a sample of Latino farmworkers in eastern North Carolina. The authors explored the relationship between stress and cognitive function in three ways: (1) cross-sectional relationship between
baseline stress and baseline cognitive function; (2) baseline stress as a predictor of subsequent cognitive function; and (3) change in stress as a predictor of change in cognitive function.

The data used in this study were collected in 2008. The initial baseline survey included 128 farmworkers who were recruited from 29 farmworker camps throughout 11 counties. In the final sample, 123 farmworkers, about 90% men, participated in both baseline and 3-month follow-up data collections. The authors measured stress with the Migrant Farmworker Stress Inventory, a 17-item self-report instrument that assesses exposure to stressors inherent in migrant farm work for adults. The study also used the Benton Visual Retention Test to measure cognitive function.

The authors found a significant correlation between baseline stress and baseline cognitive function, which became only marginally significant after full adjustment. Increased stress was also found to be associated with greater decline in cognitive function at full adjustment. While changes over time in stress seemed to be related to changes over time in cognitive function, the relationship was not statistically significant.

This report indicates that farmworkers are engaged in work that exposes them to stressors that reduce their cognitive capacity. As the report outlines, these finding have important implications for healthcare for farmworkers. The authors recommend that migrant health programs consider farmworker stress in their clinical and outreach work to help farmworkers better accommodate and cope with stressors. Such programs could include the discussion of stress at outreach visits to farmworker camps and the organization of recreational activities.

POLICY UPDATES: SUPREME COURT DECISIONS

Arizona’s SB1070

On Monday, June 25, 2012 the United States Supreme Court issued its decision on the constitutionality of Arizona’s omnibus immigration law, SB1070. The Supreme Court struck down most of the provisions, citing federal authority to enforce immigration law. However, the Supreme Court did uphold one of the most controversial provisions, Section 2(B). Section 2(B) requires Arizona law enforcement officers to verify the immigration status of people who they stop, arrest or detain if they have “reasonable suspicion” that the person is unlawfully present in the country. In a unanimous vote, the Supreme Court justices determined that federal law did not preempt this provision. However, there is currently another lawsuit pending which alleges that the provision results in racial profiling. The court noted that this provision may not withstand other kinds of legal challenges, so it may yet be struck down.

Given that the majority of America’s farmworkers are immigrants or descendants of immigrants, the Court’s decision to uphold Section 2(B) will undoubtedly impact the lives of Arizona farmworkers, including many who are U.S. citizens or lawful permanent residents.
In the months ahead, we can expect federal courts to review the blocked provisions of other state immigration laws (including Alabama and Georgia) to ensure compliance with the Supreme Court decision. Farmworker Justice will provide further analysis of immigration law and policy as events unfold.

Affordable Care Act

On Thursday, June 28, 2012, the United States Supreme Court upheld as constitutional most of the Affordable Care Act (ACA). The Court ruled that the ACA’s mandatory health insurance coverage (or “minimum coverage”) requirement is constitutional. Most uninsured people will be required to either buy health insurance or pay a tax that will be collected by the IRS. The Court also struck down a provision of the law that required states to expand Medicaid coverage. Instead, states will be able to decide if they want to apply for federal funds to expand Medicaid to many who are currently ineligible.

The ACA will positively impact farmworker health through dedicated funding to migrant and community health centers. And in those states that opt to expand Medicaid coverage, more farmworkers will be eligible for that program. However, undocumented farmworkers will be unable to reap the full benefits of healthcare reform because they are barred from participating in state health insurance exchanges and are still not eligible for Medicaid.

Farmworker Justice will work with medical providers and farmworker communities to better understand the law as ACA implementation moves forward.