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Identification of ICD codes suggestive of child maltreatment☆

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ABSTRACT

Objective: In order to be reimbursed for the care they provide, hospitals in the United States are required to use a standard system to code all discharge diagnoses: the International Classification of Disease, 9th Revision, Clinical Modification (ICD-9). Although ICD-9 codes specific for child maltreatment exist, they do not identify all maltreatment-related hospital and emergency department discharges. To increase the usefulness of medical data for public health surveillance of child maltreatment, this project sought to identify ICD-9 codes that are suggestive of child maltreatment.

Methods: After review of the literature and discussions with experts, injuries and conditions that should raise suspicion of child maltreatment (physical or sexual abuse or neglect) were identified and a list of corresponding ICD codes was compiled. Using a statewide electronic database of hospital discharges and emergency department (ED) visits for the year 2000, visits by children assigned these ICD codes were identified, a sample of visits was selected, and medical records were reviewed to assess the circumstances of the injury or illness that led to the visit. Based on information in the medical record, the injury or illness was classified as maltreatment-related, or not.

Results: There were 3,684 visits selected for review. Of these, 2,826 records were reviewed and classified; 1,200 (43%) records met the criteria for being maltreatment-related, 1,419 (50%) contained adequate information indicating the injury/condition was not likely maltreatment-related, and 207 (7%) records did not contain enough information to classify. Sixty-eight ICD codes had >66% of visits classified as maltreatment-related, the *a priori* criteria for a code to be considered suggestive of maltreatment. Codes suggestive of maltreatment include specific fractures, burns, and injuries of undetermined intent, among others.

Conclusion: Several ICD codes were found that, when used with age restrictions and other specific exclusion criteria, are suggestive of maltreatment. This information may increase the usefulness of hospital discharge data for public health surveillance of child maltreatment.

Practice implications: Use of these suggestive codes facilitates identifying conditions and injuries that are likely maltreatment-related in hospital discharge and ED visit data. When used in conjunction with ICD maltreatment-specific codes, these suggestive codes may enhance the use of medical data for monitoring child maltreatment trends.

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Introduction

Child maltreatment is a problem of significant magnitude in the United States, with nearly 800,000 children classified by child welfare agencies as abused or neglected in 2007 (US Department of Health and Human Services [USDHHS], 2009). Importantly, not only does maltreatment directly affect the lives of nearly 1 million children each year, but also the consequences of maltreatment often extend beyond childhood, resulting in significant negative health, social, and psychological outcomes among adults who were maltreated as children (Duke, Pettingell, McMorris, & Borowsky, 2010; Felitti et al., 1998; Fogarty, Fredman, Heeren, & Liebschutz, 2008; Green et al., 2010; McLaughlin et al., 2010; Sachs-Ericsson, Kendall-Tackett, Hernandez, 2007; von Tilburg et al., 2010; Whitfield, Anda, Dube, & Felitti, 2003).

Surveillance is an essential element in the public health approach to preventing child maltreatment (Whitaker, Lutzker, & Shelley, 2005). Public health surveillance is defined as the ongoing, systematic collection, analysis, interpretation, and dissemination of health-related data. The primary purpose of surveillance is to guide action and ultimately, to reduce morbidity and mortality and improve health (German et al., 2001; Kellogg & the Committee on Child Abuse and Neglect, 2005). Surveillance data are critical for measuring the magnitude of disease and other health related conditions in the population, and monitoring trends over time. These data are also used for planning and evaluating prevention programs, evaluating health policy, and prioritizing allocation of public health resources.

In 2001, the CDC entered into a cooperative agreement with the Missouri Department of Health and Senior Services (MDHSS) to develop public health surveillance of non-fatal child maltreatment by linking hospital discharge and emergency department (ED) visit data to child protective services (CPS) reports of child abuse and neglect. CPS reports are often used as the official count of child maltreatment even though under-reporting to CPS is well documented (Ewigman, Kivlahan, & Land, 1993; National Research Council, 1993; Schnitzer, Covington, Wirtz, Verhoek-Oftedahl, & Palusci, 2008; Sedlak & Broadhurst, 1996). Hospital discharge and ED visit data are an attractive mechanism for public health surveillance because they document disease and injury morbidity that is severe enough to require medical attention. Hospitals use a standard system, the International Classification of Disease, Ninth Revision, Clinical Modification (ICD-9-CM), to assign codes that describe the diagnoses, conditions, procedures, or other reasons for seeking medical care (Mistretta, de Torony, & Fairman, 2003). In the US, the Centers for Medicare and Medicaid Services and other health insurers require these ICD codes for reimbursement, making them ubiquitous in health care data and attractive for monitoring morbidity trends.

The goal of the Missouri surveillance program was to assess whether linking hospital discharge and ED visit data with CPS reports would provide a better estimate of child maltreatment incidence than CPS data alone. It was determined, however, that the linked surveillance data added few unique maltreatment cases, and the hospital discharge data identified only a subset of maltreated children (e.g., physical abuse, infants) (Schnitzer, Slusher, & Van Tuinen, 2004). These findings were largely due to the use of a surveillance case definition that required medical visits to have one of a few very specific ICD diagnostic or external cause of injury codes that indicate child maltreatment (e.g., 995.50–995.59, E967). Most of the time, when maltreatment was explicitly diagnosed and an ICD maltreatment code was assigned, the suspected maltreatment was also reported to CPS (Schnitzer et al., 2004).

Although specific ICD codes for child maltreatment exist, hospital discharge and ED visit data fail to identify child maltreatment-related injuries and illnesses for a myriad of reasons. For example, children may require medical care for conditions related to neglect, such as injuries in young children related to supervisory neglect or illnesses related to medical neglect. Neglect, however, is rarely a medical diagnosis and there are no ICD codes that would explicitly identify supervisory or medical neglect, even if these circumstances were documented in the medical record. Under-counting physical or sexual maltreatment also occurs when health care providers fail to identify child maltreatment, lack confidence to make the diagnosis, or choose not to list suspected maltreatment as a diagnosis because of legal concerns or anticipated negative consequences for the child or family (Flaherty, Jones, & Sege, 2004; Flaherty & Sege, 2005; Flaherty et al., 2006; Gessner, Moore, Hamilton, & Muth, 2004; Jenny, Hymel, Ritzen, Reinert, & Hay, 1999; Limbos & Berkowitz, 1998; Rovi & Johnson, 1999; Rovi & Johnson, 2003; Van Haeringen, Dadds, & Armstrong, 1998). It is also possible that conditions indicating maltreatment are listed in the medical record, but the person coding the data does not recognize the diagnosis as a maltreatment-related condition. Finally, because ICD codes are applied primarily for reimbursement purposes, other factors may influence coding practices.

In spite of the under-ascertainment of child maltreatment from hospital discharge and ED visit data that occurs when using ICD maltreatment codes alone to identify cases, these data may still be an important component in child maltreatment surveillance. Specifically, developing a set of criteria for including hospital discharges and ED visits likely to represent maltreatment, but not coded as such, would notably enhance the usefulness of these data for public health surveillance. As a case in point, "red flags"—conditions, injuries, or circumstances that indicate maltreatment or raise suspicion among health care providers that maltreatment has occurred—are well documented (Reece & Ludwig, 2001; Task Force for the Study of Non-accidental Injuries and Child Deaths, 1986). Examples include patterned burns (e.g., cigarette burns) or characteristic bruises (e.g., adult bite marks), as well as certain diagnoses such as subdural hematoma and retinal hemorrhages that occur in an infant without a plausible explanation provided by the child's caregiver. Assessing the possibility of including a broader range of ICD codes for surveillance of child maltreatment was a secondary goal of the Missouri project. The purpose of this manuscript is to describe the process used to identify ICD codes suggestive of child maltreatment, present the codes identified, and discuss the strengths, limitations and potential uses of these codes.