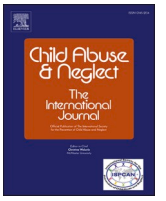
Child Abuse & Neglect 167 (2025) 107608

Contents lists available at ScienceDirect

Child Abuse & Neglect

journal homepage: www.elsevier.com/locate/chiabuneg



Changes in child placement after child abuse pediatrics consultation for suspected physical abuse

Kristine A. Campbell [a,*], Antoinette L. Laskey [a], Daniel M. Lindberg [b], M. Katherine Henry [c], Porcia Vaughn [a], James D. Anderst [d], Megan M. Letson [e], Angela N. Bachim [f], Nancy S. Harper [g], Carmen M. Coombs [h], Lori D. Frasier [i], Joanne N. Wood [j]

[a] Department of Pediatrics, University of Utah, Center for Safe and Healthy Families, Primary Children's Hospital, Salt Lake City, UT, United States of America
[b] Department of Emergency Medicine, The Kempe Center for the Prevention & Treatment of Child Abuse & Neglect, University of Colorado School of Medicine, 12401 E. 17th Ave. Mailstop B-215, Aurora, CO 80045, United States of America
[c] Division of General Pediatrics, Clinical Futures, Children's Hospital of Philadelphia, Perelman School of Medicine at the University of Pennsylvania, Roberts Center for Pediatric Research, 2716 South Street, Philadelphia, PA 19146, United States of America
[d] Children's Mercy Kansas City, UMKC School of Medicine, Kansas City, MO, United States of America
[e] Nationwide Children's Hospital, Department of Pediatrics, The Ohio State University College of Medicine, Columbus, OH, United States of America
[f] Division of Public Health Pediatrics, Department of Pediatrics, Baylor College of Medicine, Texas Children's Hospital, Houston, TX, United States of America
[g] Department of Pediatrics, University of Minnesota, University of Minnesota Masonic Children's Hospital, Center for Safe & Healthy Children, Minneapolis, MN, United States of America
[h] Department of Pediatrics, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA, United States of America
[i] Penn State Hershey Medical Center, Penn State Hershey College of Medicine, State College, PA, United States of America
[j] Division of General Pediatrics and PolicyLab, Children's Hospital of Philadelphia, Perelman School of Medicine at the University of Pennsylvania, CHOP HUB for Clinical Collaboration, 3600 Civic Center Blvd, Philadelphia, PA 19104, United States of America

A B S T R A C T

Background: The association between child abuse pediatric (CAP) assessments and child welfare outcomes is unknown.
Objective: To determine the association between a CAP determination of the likelihood of physical abuse and change in child placement. We hypothesized that child race would be associated with CAP determination of abuse likelihood and child welfare outcomes.
Participants and setting: Children under age ten years with in-person CAP consultation and referral to child protective services for suspected physical abuse at a U.S. pediatric referral center participating in CAPNET, a CAP research network, from 02/2021 to 01/2023.
Methods: We created a series of generalized estimating equations clustered by site, adding covariate blocks representing child characteristics, clinical case factors, and social risk indicators to understand the probability of placement change after CAP consultation.
Results: Of 3732 eligible children, 950 (25.5 %) experienced a placement change around a CAP consultation for physical abuse. Adjusting for site, placement change was 28.7 % (25.7–31.8 %) more likely for children with a CAP determination of a high v. lower likelihood of abuse and 6.7 % (3.1–10.4 %) more likely for children of Black/Indigenous v. other race ($p < 0.001$). These differences persisted with attenuation in fully adjusted models. There was no significant association between CAP determination and child race.

* Corresponding author.
E-mail addresses: Kristine.campbell@hsc.utah.edu (K.A. Campbell), Antoinette.Laskey@hsc.utah.edu (A.L. Laskey), Daniel.lindberg@cuanschutz.edu (D.M. Lindberg), henrym2@chop.edu (M.K. Henry), Porcia.vaughn@hsc.utah.edu (P. Vaughn), jdanderst@cmh.edu (J.D. Anderst), megan.letson@nationwidechildrens.org (M.M. Letson), Angela.Bachim@bcm.edu (A.N. Bachim), nsharper@umn.edu (N.S. Harper), Carmen.coombs2@chp.edu (C.M. Coombs), lfrasier@pennstatehealth.psu.edu (L.D. Frasier), woodjo@chop.edu (J.N. Wood).

https://doi.org/10.1016/j.chiabu.2025.107608
Received 8 January 2025; Received in revised form 27 June 2025; Accepted 17 July 2025
Available online 8 August 2025

Conclusions: CAP assessment of physical abuse likelihood is strongly associated with the probability of change in child placement. While not associated with CAP assessment of abuse likelihood, Black or Indigenous race is associated with increased probability of placement change even after adjusting for child, case, and social risk factors.

1. Background

Annually, at least 122,000 victims of child physical abuse are identified in the United States (U.S. Department of Health and Human Services, Administration for Children and Families, Administration of Children, Youth and Families, Children's Bureau, 2025). This results in almost 600 preventable child deaths every year, well-recognized physical and mental health challenges for survivors, and billions of dollars in costs (CECANF, 2016; Fang et al., 2012; E. Flaherty et al., 2019; Florence et al., 2013; U.S. Department of Health and Human Services, Administration for Children and Families, Administration of Children, Youth and Families, Children's Bureau, 2025; Segal et al., 2021; Strathearn et al., 2020). The introduction of Child Abuse Pediatrics (CAP) as a recognized subspecialty in 2006 has increased the value of medical evaluations in cases of suspected child physical abuse (Block & Palusci, 2006; Giardino et al., 2011). Through a systematic process of history taking, physical examination, radiologic testing and laboratory evaluation, CAP evaluation can reduce the risk of misdiagnosing medical conditions that may mimic abusive injuries, improve discernment of accidental from inflicted injuries, support identification of occult inflicted injuries, provide clarity on likely mechanism of injuries, and assure appropriate medical follow-up for children and families after abuse (Anderst et al., 2009; Christian & Block, 2015; McGuire et al., 2011). Little is known, however, about the child welfare outcomes following CAP evaluation, including out-of-home placement. In many settings, CAP providers (CAPs) have become integral to the multidisciplinary child welfare response to suspected child physical abuse (Svedin et al., 2021). Their role, however, is often limited to the medical evaluation and diagnosis of suspected abuse.

The interventions that follow a CAP diagnosis of abuse, such as safety planning, placement determinations, and criminal sanctions, are determined almost exclusively by child welfare and legal systems. The associations between an abuse diagnosis, child welfare intervention, and child outcome are typically unknown to health care providers. This partition between medical diagnosis and child welfare intervention diverges sharply from a traditional medical model, in which information related to diagnostic evaluations, medical interventions, and treatment outcomes is shared among subspecialists, primary care providers, and patients to assure optimal outcomes. The lack of information sharing between child welfare systems and medical referents following CPS referral is often cited as a source of frustration for pediatric medical providers and is a barrier to understanding the effectiveness of CAP practice in improving outcomes for the children receiving CAP consultation (Campbell et al., 2020; Flaherty et al., 2004, 2000).

There has also been an increased focus on racial and ethnic disparities in both the health care and child welfare systems. Child welfare research has highlighted disproportional involvement of Black/African American and Indigenous/American Indian households in child protection investigations, foster care placements, and terminations of parental rights (Drake et al., 2011, 2023; Edwards et al., 2021; Fix & Nair, 2020; Fong et al., 2021; U.S. Department of Health and Human Services, Administration for Children and Families, Administration of Children, Youth and Families, Children's Bureau, 2025; Luken et al., 2021; Putnam-Hornstein et al., 2013; Raz et al., 2021). As a social construct, racial groupings influence differential access to resources, services, and opportunities within systems that include the health care and child welfare systems in the U.S.(Flanagin et al., 2021). Moreover, perceived racial identity may support implicit or explicit assumptions regarding abilities, motives, or intent of individuals. Both societal factors and individual biases are likely to contribute to the disproportional involvement of U.S. child welfare systems with African American/Black and American Indian/Alaska Native/Indigenous children (Drake et al., 2011, 2023; Edwards et al., 2021; Luken et al., 2021; Putnam-Hornstein et al., 2013).

From a medical perspective, race has no utility in establishing an evidence-based diagnosis of child physical abuse, with limited exceptions in the recognition of differences in common cutaneous findings based on skin color. Despite this, researchers have previously identified significant racial disparities in the diagnostic consideration of physical abuse across medical settings (Jenny et al., 1999; Lane et al., 2002; Laskey et al., 2012; Wood et al., 2010). These findings have prompted the development, implementation, and adoption of evidence-based clinical decision-support tools to reduce the role of implicit bias in the medical evaluation of children presenting with injuries concerning for abuse (Berger & Lindberg, 2019; Hymel et al., 2018; Pierce et al., 2014; Rangel et al., 2009; Suresh et al., 2022). While these tools have standardized and improved the diagnostic evaluation for children with possible physical abuse, they cannot improve the CAP's understanding of interventions and outcomes following a diagnosis of child physical abuse. As pediatric subspecialists, CAPs share a professional and ethical obligation to understand how their diagnoses may influence child welfare treatment decisions, as well as the effectiveness and equity of these treatments.

For pediatricians involved in the medical evaluation of suspected child abuse, there is a gap in knowledge regarding child welfare outcomes for the patients, and the clinical and demographic factors that are associated with outcomes such as out-of-home placement. The goal of the current study is to examine out-of-home child placements following a CAP evaluation using CAPNET, a Child Abuse Pediatrics research network dedicated to prospective collection of medical, social, and outcomes data for children under ten years of age who were evaluated by CAP teams for concerns of physical abuse at ten leading U.S. pediatric referral centers. We hypothesize that there are significant differences in out-of-home placement based on Black or Indigenous child racial identity and social risk indicators, even after adjusting for injury severity and CAP diagnostic certainty of abuse.

2. Methods

2.1. Data source

Methods for the CAPNET research network have been published previously (Kratchman et al., 2022). Briefly, CAPNET collects clinical data on children under ten years of age receiving an evaluation by a CAP due to concern for physical abuse at a participating CAPNET center. Ten pediatric referral centers in the U.S. contributed data to CAPNET during the current study timeframe (CAPNET, n. d.). A consultation is eligible for CAPNET inclusion based on the following criteria: 1) age < 10 years at the start of the encounter, 2) clinical evaluation documented by a CAP due to recent (<1 month) concerns for child physical abuse, and 3) patient physically seen within a CAPNET health system. Trained data collectors or designated clinicians entered data reflecting information known to the medical team over the "CAPNET episode." This episode is defined as the period inclusive of all acute signs, symptoms, and medical encounters associated with the specific injury or illness for which the CAP consultation was initiated. The timeframe for a CAPNET episode spans from a single day up to 6 weeks following the initial CAP consultation.

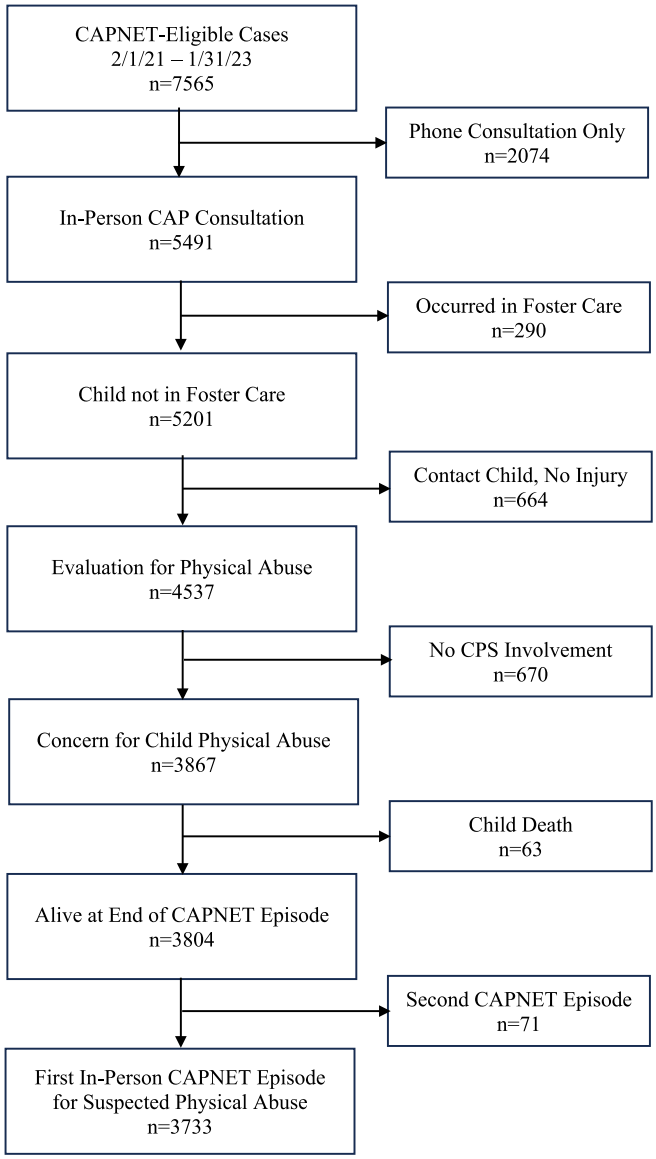


Fig. 1. Identification of study sample from the CAPNET population.

2.2. Study population

The current study included CAPNET-enrolled children with an in-person CAP consultation between February 2021 and January 2023 (Fig. 1). Children undergoing remote CAP consultation (by telephone and/or chart review) were excluded due to a lower likelihood of CAP awareness of child welfare decision-making in these cases. We excluded children seen for possible abuse while in foster care, and children without injury who were seen as only siblings or household contacts of another child given the potential for differences in child welfare decision-making for these populations. Due to a specific focus on child welfare placement determinations after CAP evaluation, children without known Child Protective Services (CPS) involvement during the CAPNET episode were excluded, as were children who died during the CAPNET episode. Finally, we included only the first CAPNET evaluation for each eligible child.

2.3. Outcome

2.3.1. Child placement

We chose to focus specifically on the outcome of *child out-of-home placement* due to the potential for childhood traumatic stress and behavioral difficulties associated with disruptions in child placement (Gypen et al., 2017; Rubin et al., 2007). For the current study, *child out-of-home placement* was defined as any change in legal custody or any out-of-home placement (relative or non-relative) known to the consulting CAP by the end of the CAPNET episode. A change in child placement could be based on a court order, child welfare safety planning, or informal agreement by a child's original caregiver.

Table 1
Covariates.

Domain	Variable	Rationale	Description
Child	Sex	Child sex has been associated with child maltreatment and may influence medical or child welfare decision-making.	Male Female
	Age	Infants are vulnerable to the deadliest forms of physical abuse such as abusive head trauma, while pre-school children require higher levels of caregiver support and supervision. Child welfare data documents that the highest risk of out of home placement is among the youngest children in the child welfare system. CAPNET documents child age at time of CAP consultation.	<6 months old ≥6 months old
	Special health care need	Prior research suggests that children with special health care needs (CSHCN) prior to abuse evaluation may be more likely to experience abuse and out of home placement. For the current study, children with a SHCN are defined as those with a complex chronic condition, medical condition, mental health condition, or developmental disability affecting daily life.	SHCN identified No SHCN
Case	Referral source	Children may come to CAP consultation through multiple referral sources. Those referred for CAP consultation by child welfare or law enforcement may have a differential risk of intervention compared to children referred by medical providers due to ongoing involvement of state agencies. CAPNET captures the referral source(s) for each eligible child.	Child welfare/ police Other referent
	Near fatal injury	Children suffering more severe inflicted injuries may have differential risk of change in caregivers due to perceived risk of future harm as well as ongoing need for complex care management. Severity of injury may be defined based on injury presentation or outcome. CAPNET relies on a consensus definition of near-fatality to identify severe injury presentations.	Near-fatal injury Other injury
	Level of care	Children requiring inpatient admission for care of potentially inflicted injury may be more likely to require increased levels of child welfare intervention. In CAPNET, each child is assigned a "highest level of care" indicator to reflect whether the child was seen in the outpatient, inpatient, or intensive care unit (ICU).	Hospital admission Outpatient care
Social	Caregiver risk	Caregiver capacity to provide safe, secure, and nurturing care is critical to child well-being. Mental health concerns, substance use, or family violence in a child's household may bias medical diagnostic decisions and influence child welfare decisions regarding child placement in cases of suspected abuse. CAPNET records caregiver risk factors identified by the medical team during CAP consultation.	Mental illness Substance misuse Domestic violence
	Household economic stability	Household financial insecurity has been associated with parental stress and child maltreatment. Reliance on public payer health insurance is one measure of economic need. CAPNET documents health care payor at the time of CAP consultation.	Public payor Other
	Geographic social risk	Community access to social and economic resources can impact parental stress and child welfare decisions, particularly when caregivers lack material support. To better understand these influences, CAPNET was linked to the 2020 Child Opportunity Index 2.0 (COI), which uses 29 indicators across 3 domains to assess geographic variation in childhood education, health and environmental resources, and social and economic opportunities across each zip code ranging from Very Low to Very High.	Low COI ZIP codes (Very low, low) High COI ZIP codes (Mod, high, very high)

2.4. Predictors

2.4.1. Likelihood of abuse

To understand the association between the outcome of a medical evaluation for suspected child physical abuse and child welfare decisions regarding change in placement, we relied on the CAP's level of concern for physical abuse in each case. This is captured using a scale ranging from 1 ("Definitely not inflicted injury") to 7 ("Definite inflicted injury") that has been used in past multicenter CAP research (Lindberg et al., 2013, 2008; Sheets et al., 2013). Previously published data from CAPNET describe full utilization of the scale by CAPNET providers, with just one-third of all CAPNET cases being rated as 5 ("Very concerning for inflicted injury"), 6 ("Substantial evidence of inflicted injury"), or 7 ("Definite inflicted injury") (Wood et al., 2022). Hypothesizing that child out-of-home placement would be associated with the medical diagnosis of physical abuse, we categorized the *likelihood of abuse* scale to reflect low likelihood (1–4) versus high likelihood (5–7) of inflicted injury.

2.4.2. Child race and ethnicity

In CAPNET, child race and ethnicity are defined based on categories within the electronic health record, typically collected by self-report from the child's caregiver. Hypothesizing that placement changes associated with CAP medical consultation would not be immune from racial disproportionality described in other sectors of the child welfare system, children identified as *Black or Indigenous* within the medical record were compared to children with other racial or ethnic identifiers. Children with unknown racial and ethnic identities were analyzed separately.

2.5. Covariates

To identify potential confounders for any observed associations between CAP medical consultations and out-of-home placements by child race identity, we examined the influence of child characteristics, medical factors, and social context available within CAPNET and through linkage with publicly available datasets (Table 1). Child characteristics, including sex, age, and pre-existing disabilities, were examined based on the relationships between these variables and both the epidemiology of child physical abuse and outcomes of child welfare (CECANF, 2016; U.S. Department of Health and Human Services, Administration for Children and Families, Administration of Children, Youth and Families, Children's Bureau, 2025; Stein et al., 2013; Van Horne et al., 2015; Zolotor & Shanahan, 2011). Descriptors related to the CAP medical encounter, including the source of the CAP referral, highest level of patient care (inpatient or outpatient), and severity of injury suffered (categorized as "near fatal" or "not near fatal" based on consensus definition), were examined (Campbell et al., 2021). Recognizing that a child's environment is central to child welfare decision-making, we captured social risk, including caregiver factors such as concerns for mental health, substance use, and intimate partner violence noted in the medical record. Medical payor (public versus other) was used as a marker of household financial insecurity. Finally, we linked a national index of child opportunity to the child's home zip code to account for geographic variation in social risk and child welfare response(Coulton et al., 2007; Diversitydatakids.org, *2023*). We did not include social risks related to prior child welfare and law enforcement involvement due to the circular reasoning based on disproportional involvement of these systems with Black and Indigenous families (Vaithianathan et al., 2017).

2.6. Analysis

We first summarized counts and percentages for all variables and examined each variable for associations with racial identifiers, change in placement, and CAPNET site. We then described the completeness and distribution of each variable and compared outcomes, exposures, and covariates between CAPNET patients with and without complete data to identify potential bias associated with missing data. We examined differences in placement change across sites using multivariable logistic regression models adjusting for child, case, and social context factors.

To address variation in change in placement across CAPNET sites, univariable and multivariable generalized estimating equations (GEE) with a logit link were fit to describe the associations between child placement, CAP assessment of abuse likelihood, and Black or Indigenous racial identity. An exchangeable working matrix was used to account for clustering of child, case, and social risk data within CAPNET sites. To better understand the association between the CAP assessment of abuse likelihood and change in placement after CAP consultation based on different racial identities, we built a series of GEE models accounting for clustering by CAPNET site (Table 1). In the first (base) model, we examined the association between CAP assessment of abuse likelihood for children of Black or Indigenous race compared to children of other racial identities. In a second (child) model, we added variables reflecting child age, sex, and pre-existing special health care needs. In a third (case) model, we entered variables capturing details related to the concern for abuse, including referral source for the CAP consultation, severity of injury, level of medical care, and the likelihood of abuse as assessed by the consulting CAP. Finally, a fourth (social) model added social indicators of caregiver risk, economic vulnerability, and ecological opportunity. In each model, we tested for an interaction between the CAP assessment of abuse likelihood and racial identity, which might suggest a differential CAP evaluation based on race, indicate differential referral patterns to CAPs based on race, or represent the role of racism in creating poverty and social risk. We set an alpha level of 0.05 to establish significance. For each model, we calculated adjusted predicted probabilities (APP) with 95 % confidence intervals (95 % CI). The APP provides an estimate of the probability of the outcome (change in placement) for children with differing CAP assessment of the likelihood of abuse and racial identities while adjusting for all confounders in the model, providing a more practical understanding of the effect of a variable than the traditional adjusted odds ratio (Williams, 2012). All analyses were performed in Stata 17.0 (Stata Statistical Software (Version Release 17)., 2021).

3. Results

3.1. Population

We identified 3733 children less than 10 years of age evaluated in a face-to-face CAP consultation for suspected child physical abuse between February 2021 and January 2023 by CAPNET medical teams (Fig. 1). Complete data was available for 87.9 % (3278/3733) of children in the dataset. Missing variables included race ($n = 395$, 10.6 %), insurance ($n = 49$, 1.3 %), Child Opportunity Index ($n = 25$, 0.7 %) and sex ($n = 1$, 0.1 %). Almost one-third ($n = 113$, 28.9 %) of cases with missing race were coded as "multiracial" without specification of contributing racial identity within the medical record. The single child with an unknown sex identifier was dropped from analysis due to modeling requirements, leaving a total population of 3732 children.

Overall missingness ranged significantly across sites from 5.6 to 26.5 % (median 13.5 %, IQR 11.5–17.5 %, Kruskal-Wallis $p < 0.001$). Adjusting for variation by site, missingness was not significantly associated with a change in placement or CAP assessment of abuse likelihood. Children with a Black or Indigenous race identifier were more likely to have incomplete data than children with other racial identifiers (+1.4 %, $p = 0.04$), and those with an unknown race were also more likely to have additional incomplete data (+2.4 %, $p = 0.03$). Evaluation of missingness based on covariates yielded additional associations with missingness, largely related to missing or unknown racial identity. Children with pre-existing special health care needs were significantly less likely (−3.8 %, p = 0.04) to have missing data compared to those without such needs, while those with near-fatal injuries were significantly more likely (+7.9 %, $p = 0.002$) to have at least one missing variable than children with less serious injury. Cases with caregiver risk factors such as mental illness (+6.4 %, $p < 0.001$) or intimate partner violence (+5.0 %, $p = 0.001$) identified in the CAP evaluation all had increased rates of missing data compared to cases without these risks, although this was not observed among cases where caregiver substance use was identified as a concern. Finally, children with public insurance were more likely to have missing data compared to those with private insurance (+3.4 %, $p = 0.01$), and those with missing insurance data were more likely to have at least one additional missing data point (+14.8 %, p = 0.002). Based on these findings, all cases with missing data were retained for analysis with missingness represented as an unknown category.

3.2. Demographics and clinical characteristics

Nearly one-quarter of children were identified as Black/African-American ($n = 839$, 22.5 %) or American-Indian/Indigenous ($n = 27$, 0.7 %). Children in the primary comparison group were identified as White ($n = 2403$, 97.1 %), Asian ($n = 65$, 2.6 %), and Native Hawaiian/Pacific Islander ($n = 11$, 0.4 %). The race of 276 (7.4 %) children was unknown due either to true unknown/deferred race or to a multiracial designation without further specification. Almost half of all children had a high likelihood of abusive injury based on CAP assessment ($n = 1808$, 48.4 %) (Table 2). In bivariate comparisons, we identified no association between child racial identity and

Table 2
Demographics.

Attributes	Frequency	Percentage
	$n = 3732$	%
Primary predictors		
High likelihood of physical abuse[a]	1805	48.4 %
Black or indigenous racial identity	863	23.1 %
Child characteristics		
Age under 6 months	1227	32.9 %
Female sex	1500	40.2 %
Special health care need	412	11.0 %
Case characteristics		
Referral from child welfare or law enforcement	808	21.7 %
Inpatient care required	1796	48.1 %
Near-fatal injury[b]	211	5.7 %
Social characteristics		
Caregiver risk indicators[c]		
None	2124	56.9 %
Mental health	1025	27.5 %
Substance use	633	17.0 %
Intimate partner violence	762	20.4 %
Socioeconomic vulnerability		
Public insurance or uninsured[d]	2936	78.7 %
Low or very low child opportunity zip code[e]	1885	50.5 %

[a] Assessment by consulting Child Abuse Pediatrician of findings "Very concerning for inflicted injury", "Substantial evidence of inflicted injury" or "Definite abuse".
[b] Near fatal injury requires intubation for respiratory failure, antidote for toxic ingestion and/or cardiac arrhythmia.
[c] Caregivers' factors documented in the medical record during a medical evaluation for suspected child physical abuse.
[d] Medicaid, Children Health Insurance Program, Indian Health Service, or Self-Pay/Uninsured.
[e] Home zip code in the lowest two quintiles for state-normed rankings of the Children's Opportunity Index.

CAP assessment of abuse likelihood ($p = 0.8$). One-third of eligible children ($n = 1227$, 32.9 %) were under six months of age at the time of CAP consultation for suspected physical abuse. A substantial proportion of children experienced inpatient care for injuries ($n = 1796$, 48.1 %), but near-fatalities were relatively rare ($n = 211$, 5.7 %). At least one caregiver risk factor was identified during the CAPNET episode in 1608 (43.1 %) of eligible cases. Economic vulnerability reflected by public payor health coverage was noted in a majority of children ($n = 2936$, 78.7 %) and just over half ($n = 1885$, 50.5 %) had home zip codes rated in the lowest quartiles of child opportunity by the state-level Child Opportunity Index.

3.3. CAPNET site variation

The volume of CAP consultations varied significantly between sites, with a median of 352 (IQR 217, 520) children from each center. The proportion of children identified as Black or Indigenous ranged from 5.4 to 51.6 % across centers (median 24.1 %, IQR 10.5–32.7 %, Kruskal-Wallis $p < 0.001$). CAP assessment of a high likelihood of physical abuse ranged from 37.8 to 70.8 % (median 47.4 %, IQR 44.2–56.6 %, Kruskal-Wallis $p < 0.001$), suggesting differences in patient mix and provider practice. Across sites, 20.3–46.9 % of all children with an in-person CAP consultation for suspected physical abuse were known to have experienced a change in placement around the time of this encounter (median 25.5 %, IQR 21.0–30.4 %, Kruskal-Wallis $p < 0.001$).

Acknowledging differences in case mix across sites, we examined placement change after adjustment for CAP assessment of likelihood of abuse (low/high), child factors (race, age, sex, presence of a special health care need), case factors (source of referral, inpatient admission, near fatality), and social risk indicators (caregiver risks, medical payor, and Child Opportunity Index). Adjusting for these factors attenuated but did not eliminate the significant differences, with an adjusted predicted probability of placement

Table 3
Predicted Probability of Out of Home for Children with a CAP Evaluation for Suspected Physical Abuse, Adjusted for CAPNET Site Variability.

Reference category is first response option for each variable except for Caregiver Risk Indicator, in which each option is compared to absence of the specific risk indicated		Predicted probability	95 % CI
Primary predictors			
CAP assessment[b]	Lower Likelihood of Physical Abuse (1–4)	13.6 %	10.2–17.0 %
	High Likelihood of Physical Abuse (5–7)*	42.3 %	37.4–47.2 %
Race	Neither Black nor Indigenous race	25.5 %	21.2–29.7 %
	Black or Indigenous race*	32.2 %	26.9–37.4 %
	Unknown race* ($n = 395$)	31.7 %	25.5–37.8 %
Child characteristics			
Child <6 months of age	No	24.0 %	20.1–27.8 %
	Yes*	34.9 %	30.2-39.6 %
Child sex	Male	27.3 %	23.8–33.3 %
	Female	28.6 %	22.8–31.8 %
Special health care need	No	28.2 %	23.8–32.6 %
	Yes	25.0 %	19.3–30.8 %
Case characteristics			
Child welfare or law enforcement referral	No	27.2 %	22.7–31.6 %
	Yes	29.8 %	24.4–35.3 %
Inpatient care	No	20.6 %	17.3–24.0 %
	Yes*	34.2 %	30.3-38.1 %
Near fatality[a]	No	26.4 %	22.3–30.5 %
	Yes*	48.3 %	40.3-56.2 %
Social characteristics			
Caregiver risk indicators[c]	No Identified Risk*	21.3 %	17.4–25.2 %
	Mental Health*	37.2 %	32.1–42.4 %
	Substance Use*	41.3 %	35.6–47.0 %
	Intimate Partner Violence*	33.4 %	27.9–38.8 %
Medical payer[d]	Private/Military	11.4 %	7.5–15.3 %
	Public/Uninsured*	32.2 %	27.2-37.2 %
	Unknown (n = 49)*	33.3 %	19.4–47.1 %
ZIP Code Childhood Opportunity Index[e]	Moderate, High, or Very High Childhood Opportunity	31.6 %	27.0–36.1 %
	Low or Very Low Childhood Opportunity*	23.8 %	19.6–28.0 %
	Unknown (n = 25)	24.1 %	7.0–41.1 %

* $p < 0.001$.

[a] Assessment by consulting Child Abuse Pediatrician as "Very concerning for inflicted injury", "Substantial evidence of inflicted injury" or "Definite abuse".

[b] Intubation for respiratory failure, antidote for toxic ingestion and/or cardiac arrhythmia.

[c] Caregivers' factors documented in the medical record during CAPNET episode.

[d] Public payer includes Medicaid, Children Health Insurance Program, or Indian Health Service.

[e] Home zip code in the lowest two quintiles for state-normed rankings of the Children's Opportunity Index.

ranging from 21.9 to 37.9 % (median 23.3 %, IQR 21.9–27.6 %, Kruskal-Wallis $p < 0.001$). This unexplained but significant variation in placement changes across CAPNET sites supported a decision to cluster subsequent models by site.

3.4. Change in placement

Overall, 950 of 3732 (25.5 %) of children with an in-person CAP evaluation for suspected child physical abuse experienced a change in placement around the time of consultation. Adjusting for CAPNET site, change in placement was 3.1 times as likely for children with a CAP assessment of a high likelihood of abuse compared to those with a low likelihood of abuse (42.3 % v. 13.6 %), and 1.3 times as likely for children identified as Black or Indigenous race compared to children with any other racial identity (32.2 % v. 25.5 %, $p < 0.001$) (Table 3). Children under 6 months of age were 1.5 times as likely to experience a change in placement compared to older children (34.9 % v. 24.0 %, $p < 0.001$), but no significant difference in placement likelihood was noted based on child sex or pre-existing special health care needs. While the source of the CAP referral did not predict case outcomes, injuries requiring hospitalization and near-fatal injuries were associated with a 1.6 (34.2 % v. 20.6 %, $p < 0.001$)) and 1.8 (48.3 % v. 26.4 %, $p < 0.001$) increased likelihood of placement change compared to cases without those characteristics, respectively. Caregiver risk factors were associated with a 1.1–1.7 fold increased likelihood of out-of-home placement compared to cases with no caregiver risk factors identified. Children with public insurance had a 2.9 times increased likelihood of placement change compared to those with private insurance (32.1 % v. 11.4 %, $p < 0.001$). Similarly, children with a home address in a ZIP code ranked as low or very low in childhood opportunities for well-being in education, health and environment, and socioeconomic resources was associated with a 1.3-fold increased risk for placement change (31.6 % v. 23.8 %, $p < 0.001$) compared to those living in a higher resourced community.

3.5. Predicting change in placement around CAP consultation

In a base model including the CAP assessment of likelihood of abuse and child race, children with a high likelihood of abuse were significantly more likely to experience change in placement (APP 42.0 %, 95 %CI 37.3–46.7 %) than those with lower concern for abuse (APP 13.5 %, 95 %CI 10.2–16.7 %) ($p < 0.001$) (Table 4). Children with Black or Indigenous racial identity were also more likely to have a change in placement (APP 31.1 %, 95 % CI 26.5–35.8 %) than those of other racial identities (APP 25.3 %, 95 % CI 21.5–29.0 %) ($p < 0.001$). There was no significant interaction between CAP assessment of likelihood of abuse and child race, allowing us to exclude this from subsequent models.

In the child model, after adjusting for additional patient characteristics including young age, sex, and special health care needs, the increased probability of change in placement persisted for cases with a high likelihood of abuse and those children with Black or Indigenous racial identity. Age under 6 months was also associated with a higher probability of change in placement (APP 31.5 %, 95 % CI 27.6–35.4 %) compared to those children 6 months and older at the time of CAP consultation (24.2 %, 95 % CI 20.9–27.5 %) ($p < 0.001$).

The case model was built on prior models with the addition of clinical factors, including the source of the CAP referral, the need for inpatient care, and severity of the child's injury. Again, we observed a significantly increased probability for change in placement based on likelihood of abuse and the child's racial identity. Additionally, children referred for CAP consultation by law enforcement or child welfare services were more likely to have a change in placement (APP 37.1 %, 95 % CI 33.0–41.2 %) than those coming to CAP attention through alternate routes (APP 23.5 %, 95 % CI 21.3–25.7 %) ($p < 0.001$). Those requiring inpatient care for injury were also more likely to change placement (APP 32.8 %, 95 % CI 29.9–35.7 %) than those seen by CAPs in the outpatient or emergency department setting (APP 19.6 %, 95 % CI 17.1–22.1 %) ($p < 0.001$). Similarly, those with near-fatal injuries were more likely to experience a placement change (APP 35.3 %, 95 % CI 29.1–41.4 %) than children with less severe injuries (APP 25.3 %, 95 % CI 23.2–27.5 %) ($p < 0.001$).

In the final social risk model, indicators of caregiver, household, and environmental risk were added to the case model. The significant association between CAP assessment and change in placement was preserved as in previous models. The association between child race and change in placement was slightly attenuated but remained significant even after social risk adjustment. We noted an increased probability of out-of-home placement based on known concerns for caregiver mental health (APP 30.1 %, 95 % CI 26.9–33.3 %) or substance use were associated with an increased risk in a change in placement (35.0 %, 95 % CI 31.1–38.9 %) compared to those children without these risk exposures (both $p < 0.001$). Reliance on public insurance, our marker for household economic security, was associated with more than twice the risk of change in placement (APP 29.2 %, 95 % CI 26.7–31.7) compared to those households with other insurance sources (12.6 %, 95 % CI 9.7–15.5 %) ($p < 0.001$). Finally, a home address in a ZIP code in the lowest quintiles of childhood opportunity was significantly associated with out-of-home placement (APP 28.1 %, 95 % CI 25.5–30.8 % v. APP 24.2 %, 95 % CI 21.6–26.8 %) ($p = 0.001$).

Table 4
Adjusted predicted probability of out-of-home placement for children with a CAP Evaluation for suspected physical abuse adjusted for CAPNET site variability.

Predictor		Base model	Child model	Case model	Social model
Primary predictors	CAP assessment[b]				
	Lower Likelihood (1–4) (ref)	13.5 % (10.2–16.7 %)	13.3 % (10.4–16.1 %)	12.9 % (10.8–14.5 %)	13.4 % (11.2–15.6 %)
	High Likelihood (5–7)	42.0 % (37.3–46.7 %)***	40.9 % (36.8–45.0 %)***	39.4 % (36.4–42.4 %)***	39.2 % (36.1–42.2 %)***
	Race				
	Neither Black nor Indigenous (ref)	25.3 % (21.5–29.0 %)	24.6 % (21.3–27.8 %)	23.8 % (21.6–26.1 %)	25.0 % (22.6–27.5 %)
	Black or Indigenous	31.1 % (26.5–35.8 %)***	31.0 % (26.8–35.2 %)***	30.5 % (27.1–33.8 %)***	28.8 % (25.5–32.1 %)*
	Unknown	31.4 % (25.8–37.0 %)**	31.0 % (25.9–36.2 %)**	29.5 % (25.8–31.9 %)**	28.1 % (23.8–32.5 %)
Child characteristics	Child Age < 6 Months				
	No (ref)	–	24.2 % (20.9–27.5 %)	24.4 % (22.0–26.8 %)	24.7 % (22.0–26.8 %)
	Yes	–	31.5 % (27.6–35.4 %)***	28.8 % (25.8–31.8 %)**	29.3 % (25.8–31.8 %)**
	Sex				
	Male (ref)	–	26.0 % (22.7–29.3 %)	25.4 % (22.9–27.6 %)	25.7 % (23.2–28.2 %)
	Female	–	28.0 % (24.4–31.6 %)	28.0 % (24.4–31.6 %)	27.2 % (24.5–30.0 %)
	Special Health Care Need				
	No (ref)	–	26.8 % (23.6–30.0 %)	26.1 % (23.9–28.2 %)	26.4 % (24.1–28.7 %)
	Yes	–	26.7 % (21.6–31.7 %)	25.4 % (21.1–29.8 %)	25.5 % (21.2–29.8 %)
Case characteristics	Child Welfare/Law Enforcement Referral				
	No (ref)	–	–	23.5 % (21.3–25.7 %)	24.1 % (21.8–26.4 %)
	Yes	–	–	37.1 % (33.0–41.2 %)***	35.7 % (31.7–39.8 %)***
	Inpatient Care				
	No (ref)	–	–	19.6 % (17.1–22.1 %)	20.7 % (18.0–23.4 %)
	Yes	–	–	32.8 % (29.9–35.7 %)***	32.0 % (29.1–35.0 %)***
	Near Fatality[a]				
	No (ref)	–	–	25.3 % (23.2–27.5 %)	25.7 % (23.5–28.0 %)
	Yes	–	–	35.3 % (29.1–41.4 %)***	33.9 % (27.9–39.8 %)**
Social characteristics	Caregiver Risk Indicators[c]	–	–	–	
	No Intimate Partner Violence (ref)	–	–	–	26.7 % (24.3–29.0 %)
	Intimate Partner Violence	–	–	–	25.1 % (21.8–28.4 %)
	No Mental Health Concerns (ref)	–	–	–	24.6 % (22.2–27.0 %)
	Mental Health Concerns	–	–	–	30.1 % (26.9–33.3 %)***
	No Substance Use Concerns (ref)	–	–	–	24.3 % (22.0–26.2 %)
	Substance Use Concerns	–	–	–	35.0 % (31.1–38.9 %)†
	Medical Payer[d]				
	Private/Military (ref)	–	–	–	12.6 % (9.7–15.5 %)
	Public/Uninsured	–	–	–	29.2 % (26.7–31.7 %)†
	Unknown (n = 49)	–	–	–	30.2 % (18.5–42.0 %)†
	Community-Level Childhood Opportunity[e]				
	Moderate, High, or Very High Childhoood Opportunity (ref)	–	–	–	24.2 % (21.6–26.8 %)
	Low or Very Low Childhoood Opportunity	–	–	–	28.1 % (25.5–30.8 %)**
	Unknown (n = 25)	–	–	–	28.4 % (10.7–46.0 %)

* $p < 0.05$, (ref) Reference Category, – Not included in model.
** $p < 0.01$.
*** $p < 0.001$.
[a] Assessment by consulting Child Abuse Pediatrician as “Very concerning for inflicted injury”, “Substantial evidence of inflicted injury” or “Definite abuse”.
[b] Intubation for respiratory failure, antidote for toxic ingestion and/or cardiac arrhythmia.
[c] Caregivers' factors documented in the medical record during the CAPNET episode.
[d] Public payer includes Medicaid, Children Health Insurance Program, or Indian Health Service.
[e] Home zip code in the lowest two quintiles for state-normed rankings of the Children's Opportunity Index.

4. Discussion

This study relies on a unique multicenter database to examine known child welfare outcomes for children under ten years of age undergoing in-person consultation with a CAP provider due to concerns for child physical abuse. We chose to focus on changes in placements known to treating CAPs due to the association between child well-being and placement stability that has been established in past research (Gypen et al., 2017; Rubin et al., 2007). Our study found that CAP assessment of abuse and race were key predictors of change in placement, even after accounting for significant differences in this outcome across academic centers.

Our results demonstrate that one-quarter (25.5 %) of children under ten years of age referred to CPS and evaluated by a CAP for suspected physical abuse will experience a change in placement associated with child welfare intervention around the time of CAP consultation. Although a high level of concern for abuse based on CAP evaluation was the strongest predictor of placement change, 18 % of children thought to be at lower risk for physical abuse by the CAP still experienced placement change after consultation. While some of these placements may have been short-lived, may have occurred for reasons other than physical abuse, or may have been initiated before CAP evaluation, the impact of these placements on the child and their family is still likely to be significant. The overall number of out-of-home placements is almost certainly an underestimate, as CAPs may be unaware of child welfare interventions even in cases where they are relied upon for expertise in the evaluation and diagnosis of child physical abuse.

We observed significant variation in placement change between CAPNET sites, even accounting for case mix. After adjusting for CAP assessment of abuse likelihood, child characteristics, case characteristics and social risk indicators, our results suggest that among children referred to CPS the probability of placement change after CAP consultation for suspected physical abuse ranges from 21.9 % to 47.9 % across sites. These differences may reflect limitations in the CAPNET data collection— some CAPNET centers may have clinical practices that routinely see children with a low baseline probability of out-of-home placement, while others may be consulted more often when a child welfare agency is already in the process of removal. We cannot exclude the possibility, however, that at least some of the variation in placement across sites reflects true differences in system response to children after abuse, including variability in child welfare decisions, law enforcement investigations, court orders, and CAP evaluations. While not the original focus of our study, we believe that placement change should not be dependent on geography (Yi et al., 2020). A better understanding of the reasons for this variation in the probability of out-of-home placement after CAP consultation based on geography is urgently needed. Unfortunately, such outcomes that are most meaningful for medical providers—child safety and well-being, family supports and services, subsequent maltreatment prevention—are typically unknown to both clinicians and researchers due to limited data sharing between health and child welfare systems.

We identified two key predictors of changes in placement for children evaluated by a CAP for suspected physical abuse. First, we found that the strongest predictor of change in placement is the CAP assessment of the abuse likelihood, with 25.8 % higher adjusted probability of change in placement for children with a high likelihood of abuse compared to children with a low likelihood of abuse based on CAP evaluation. This finding highlights the importance of this medical evaluation and the need for a standardized, evidence-based approach to diagnosis in cases of possible physical abuse (Anderst et al., 2009; Christian & Block, 2015; Haney et al., 2025; Narang et al., 2025). Second, we found that Black and Indigenous children have a 3.8 % higher adjusted probability of experiencing a change in placement around the time of CAP consultation compared to children of other races, even after accounting for child, case, and social risk factors. This small but significant difference in probability of placement change based on racial identity raises important concerns that individual bias or societal inequities in decisions related to child placement for suspected physical abuse may still be influencing critical interventions for some children and families in historically marginalized communities.

Federal and state child welfare policies in the US are intended to support both safety and stability for children experiencing maltreatment. Reliance on out-of-home placements and caregiver change has declined steadily over recent decades (U.S. Department of Health and Human Services, Administration for Children and Families, 2024). Despite this, there will always be children who require temporary or permanent changes in their environments to ensure safety and well-being. All providers involved in the multidisciplinary response to children with suspected maltreatment benefit from understanding those factors associated with out-of-home placement or change in caregivers for children in their care. For child welfare systems, early integration of specialty medical providers may help guide an evidence-based evaluation of the likelihood of physical abuse in specific cases. For CAPs, recognizing children at the highest risk of placement change may allow health care systems to support families in identifying alternative caregivers or informal kinship systems that might provide a child with familiar and safe conditions during a child welfare investigation.

The strong association between the outcome of a medical evaluation and change in placement highlights the critical need for a careful, standardized approach to the medical evaluation of possible child physical abuse. Prior research finds that a CAP evaluation can reduce the concern for a diagnosis of physical abuse in children referred for medical assessment (Anderst et al., 2009; Zamalin et al., 2023). These shifts in concern regarding abuse may stem from the CAP's understanding of injury mechanisms, enhanced access to the child's medical history, a broader consideration of alternative diagnoses, increased availability of multidisciplinary investigation information, or a more conservative definition of abuse within established CAP practices. Regardless of the underlying reason, however, we believe that the current study supports the need for evidence-based medical assessment of the likelihood of physical abuse to ensure that placement decisions are made with the best available diagnostic information.

The persistent disparity in the probability of change in placement for Black and Indigenous children evaluated for possible physical abuse must also be acknowledged in the multidisciplinary child welfare response. The evolving perspective on racial and ethnic disparities within the child welfare system has tended to favor theories of increased child abuse risk within communities historically disadvantaged by systemic racism and classism (Drake et al., 2011, 2023; Putnam-Hornstein et al., 2013, 2022). These societal inequities likely account for much of the disparities observed within the system. It is important to recognize, however, that medical research has repeatedly demonstrated the influence of implicit bias in medical decision-making, demonstrating excess evaluation of

Black children presenting to EDs with injuries when compared to White children presenting with comparable injuries; increased likelihood of medical evaluation of siblings of Black or Hispanic children compared to White children with high suspicion for physical abuse; and changes in diagnosis of abuse based on perceived social risks (Hymel et al., 2018; Keenan et al., 2017; Laskey et al., 2012; Lindberg et al., 2013; Wood et al., 2010). Even as validated clinical decision support tools have reduced the role of bias in medical evaluation and diagnosis in such cases, it is important to continue to acknowledge the potential for implicit bias to shape the individual responses of both medical and child welfare professionals. The introduction of bias reduction strategies at each stage of response to cases of possible child physical abuse can continue to narrow differences in child welfare outcomes based on racial identity alone.

4.1. Limitations

Our study must be considered in light of important limitations. First, as a retrospective study drawn from medical records, we cannot determine the causal relationship between a CAP diagnosis, a child's racial identity, and the change in placement associated with the abuse concerns recorded in CAPNET. Additionally, demographic details, such as race and medical payer, are gathered from the electronic medical record and may not be accurate. While we used medical payer type and the Child Opportunity Index as proxy indicators of socioeconomic risk (e.g., household poverty, social support), true measures are not available and are likely to influence placement decisions. Finally, our dataset is limited in the information available related to placement changes. CAPNET reflects only those placement changes known to the CAP at the time of completion of the medical evaluation. We cannot distinguish between placement changes occurring before the CAP evaluation from those that occur only after CAP evaluation, and in the case of children removed prior to CAP evaluation, it is possible that a medical diagnosis might be associated with reunification rather than out-of-home placement. CAPNET does not capture all changes in placement related to an abuse finding, as a change in placement may occur well after completion of the CAP evaluation. We cannot identify the cause of the placement change, and these changes may have occurred due to maltreatment concerns other than physical abuse, such as neglect or sexual abuse. There may be more bias in changes in placement that occur early in a child welfare investigation, which would be disproportionately captured in CAPNET data. We believe that disproportionality earlier in a child welfare investigation is still important to recognize as it may suggest differential efforts to support safe and stable placement for different children and families.

4.2. Conclusion

As a bridge between health care and child welfare systems, CAPS must understand the relationship between their evaluations and child welfare outcomes likely to be experienced by the patients and families presenting for consultation. One-quarter of children under ten years of age seen by a child abuse pediatrician in consultation for possible child physical abuse and referral to CPS will experience a change in placement due to events surrounding that consultation. The CAP diagnosis related to abuse is strongly associated with a change in placement, supporting the importance of assuring systematic, evidence-based medical evaluations for these children. Children with a Black or Indigenous racial identity were 3.8 % more likely to experience a change in placement compared to children of other racial identities, even accounting for child, case, and social risk factors. This highlights the need for continued vigilance against bias and inequity in both medical and child welfare systems.

CRediT authorship contribution statement

Kristine A. Campbell: Writing – review & editing, Writing – original draft, Visualization, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Antoinette L. Laskey:** Writing – review & editing, Resources, Data curation. **Daniel M. Lindberg:** Writing – review & editing, Project administration, Funding acquisition, Data curation. **M. Katherine Henry:** Writing – review & editing, Methodology, Data curation. **Porcia Vaughn:** Writing – review & editing, Visualization, Project administration, Data curation. **James D. Anderst:** Writing – review & editing, Data curation. **Megan M. Letson:** Writing – review & editing, Data curation. **Angela N. Bachim:** Writing – review & editing, Data curation. **Nancy S. Harper:** Writing – review & editing, Data curation. **Carmen M. Coombs:** Writing – review & editing, Data curation. **Lori D. Frasier:** Writing – review & editing, Data curation. **Joanne N. Wood:** Writing – review & editing, Methodology, Funding acquisition, Data curation.

Funding/support

CAPNET was supported by the Eunice Kennedy Shriver National Institute for Child Health and Human Development R24HD098415. Additionally, Dr. Henry's time was supported under grant number K08HS028847 from the Agency for Healthcare Research and Quality (AHRQ), U.S. Department of Health and Human Services (HHS). The authors are solely responsible for this document's contents, findings, and conclusions, which do not necessarily represent the views of NICHD or AHRQ. Readers should not interpret any statement in this report as an official position of NICHD, AHRQ or HHS.

Declaration of competing interest

Drs. Frasier and Lindberg have provided paid expert witness testimony in cases with concern for child physical abuse. The institutions of Drs. Campbell, Harper, Henry, Laskey and Wood have received payment for expert witness testimony. The other authors report no conflicts of interest.

Acknowledgments

We would like to acknowledge the following CAPNET team members who contributed to database design, data entry and/or data management: Jenna Kiely, Jan Leonard, Kendal Marston, Loralie Peterson and Cassandra Vigil.

Data availability

The data that has been used is confidential. CAPNET data can be used for approved research protocols as described at https://capnetresearch.org/.

References

Anderst, J., Kellogg, N., & Jung, I. (2009). Is the diagnosis of physical abuse changed when child protective services consults a child abuse pediatrics subspecialty group as a second opinion? *Child Abuse & Neglect, 33*(8), 481–489. https://doi.org/10.1016/j.chiabu.2009.05.001

Berger, R. P., & Lindberg, D. M. (2019). Early recognition of physical abuse: Bridging the gap between knowledge and practice. *The Journal of Pediatrics, 204*, 16–23. https://doi.org/10.1016/j.jpeds.2018.07.081

Block, R. W., & Palusci, V. J. (2006). Child abuse pediatrics: A new pediatric subspecialty. *The Journal of Pediatrics, 148*(6), Article 6. https://doi.org/10.1016/j.jpeds.2006.01.033

Campbell, K. A., Wood, J. N., Lindberg, D. M., & Berger, R. P. (2021). A standardized definition of near-fatal child maltreatment: Results of a multidisciplinary Delphi process. *Child Abuse & Neglect, 112*, Article 104893. https://doi.org/10.1016/j.chiabu.2020.104893

Campbell, K. A., Wuthrich, A., & Norlin, C. (2020). We have all been working in our own little silos forever: Exploring a cross-sector response to child maltreatment. *Academic Pediatrics, 20*(1), Article 1. https://doi.org/10.1016/j.acap.2019.06.004

CAPNET. (n.d.). CAPNET. Retrieved April 17, 2025, from https://capnetresearch.org/.

Christian, C. W., & Block, R. (2015). The evaluation of suspected child physical abuse. *Pediatrics, 135*(5), e20150356. https://doi.org/10.1542/peds.2015-0356

Commission to Eliminate Child Abuse and Neglect Fatalities (CECANF). (2016). *Within our reach: A national strategy to eliminate child abuse and neglect fatalities*. Washington, DC: Government Printing Office. http://www.acf.hhs.gov/programs/cb/resource/cecanf-final-report.

Coulton, C. J., Crampton, D. S., Irwin, M., Spilsbury, J. C., & Korbin, J. E. (2007). How neighborhoods influence child maltreatment: A review of the literature and alternative pathways. *Child Abuse & Neglect, 31*(11−12), 1117–1142. S0145-2134(07)00248-7 [pii] https://doi.org/10.1016/j.chiabu.2007.03.023.

Diversitydatakids.org. (). Data for a Diverse and Equitable Future |. *https://www.diversitydatakids.org/*.

Drake, B., Jolley, J. M., Lanier, P., Fluke, J., Barth, R. P., & Jonson-Reid, M. (2011). Racial bias in child protection? A comparison of competing explanations using national data. *Pediatrics, 127*, 471–478. https://doi.org/10.1542/peds.2010-1710

Drake, B., Jones, D., Kim, H., Gyourko, J., Garcia, A., Barth, R. P., … Jonson-Reid, M. (2023). Racial/ethnic differences in child protective services reporting, substantiation and placement, with comparison to non-CPS risks and outcomes: 2005–2019. *Child Maltreatment, 107755952311673*. https://doi.org/10.1177/10775595231167320

Edwards, F., Wakefield, S., Healy, K., & Wildeman, C. (2021). Contact with child protective services is pervasive but unequally distributed by race and ethnicity in large US counties. *Proceedings of the National Academy of Sciences, 118*(30), Article e2106272118. https://doi.org/10.1073/pnas.2106272118

Fang, X., Brown, D. S., Florence, C. S., & Mercy, J. A. (2012). The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse & Neglect, 36*(2), 156–165. https://doi.org/10.1016/j.chiabu.2011.10.006

Fix, R. L., & Nair, R. (2020). Racial/ethnic and gender disparities in substantiation of child physical and sexual abuse: Influences of caregiver and child characteristics. *Children and Youth Services Review, 116*, Article 105186. https://doi.org/10.1016/j.childyouth.2020.105186

Flaherty, E., Legano, L., & Idzerda, S. (2019). Ongoing pediatric health care for the child who has been maltreated. *Pediatrics, 143*(4), Article e20190284. https://doi.org/10.1542/peds.2019-0284

Flaherty, E. G., Jones, R., & Sege, R. (2004). Telling their stories: Primary care practitioners' experience evaluating and reporting injuries caused by child abuse. *Child Abuse & Neglect, 28*, 939–945. https://doi.org/10.1016/j.chiabu.2004.03.013 [doi] S0145-2134(04)00183-8 [pii].

Flaherty, E. G., Sege, R., Binns, H. J., Mattson, C. L., & Christoffel, K. K. (2000). Health care providers' experience reporting child abuse in the primary care setting. Pediatric practice research group. *Archives of Pediatrics & Adolescent Medicine, 154*, 489–493.

Flanagin, A., Frey, T., & Christiansen, S. L. (2021). (2021). Updated guidance on the reporting of race and ethnicity in medical and science journals. *JAMA, 326*(7), 621–627. https://doi.org/10.1001/jama.2021.13304

Florence, C., Brown, D. S., Fang, X., & Thompson, H. F. (2013). Health care costs associated with child maltreatment: Impact on Medicaid. *Pediatrics, 132*(2), 312–318. https://doi.org/10.1542/peds.2012-2212

Fong, H., Lindsey, M. A., Cruz-Gonzalez, M., Beardslee, W., & Alegria, M. (2021). Racial/ethnic disparities in depression treatment for caregivers investigated by the US child welfare system. *Academic Pediatrics, 21*(6), 1037–1045. https://doi.org/10.1016/j.acap.2021.02.004

Giardino, A. P., Hanson, N., Hill, K. S., & Leventhal, J. M. (2011). Child abuse pediatrics: New specialty, renewed mission. *Pediatrics, 128*(1), Article 1. https://doi.org/10.1542/peds.2011-0363

Gypen, L., Vanderfaeillie, J., De Maeyer, S., Belenger, L., & Van Holen, F. (2017). Outcomes of children who grew up in foster care: Systematic-review. *Children and Youth Services Review, 76*, 74–83. https://doi.org/10.1016/j.childyouth.2017.02.035

Haney, S., Scherl, S., DiMeglio, L., Perez-Rossello, J., Servaes, S., & Merchant, N. (2025). Evaluating young children with fractures for child abuse: Clinical report. *Pediatrics, 155*(2), Article e2024070074. https://doi.org/10.1542/peds.2024-070074

Hymel, K. P., Laskey, A. L., Crowell, K. R., Wang, M., Armijo-Garcia, V., Frazier, T. N., Tieves, K. S., Foster, R., Weeks, K., & Pediatric Brain Injury Research Network (PediBIRN) Investigators. (2018). Racial and ethnic disparities and bias in the evaluation and reporting of abusive head trauma. The Journal of Pediatrics, 198, 137-143.e1. https://doi.org/10.1016/j.jpeds.2018.01.048.

Jenny, C., Hymel, K. P., Ritzen, A., Reinert, S. E., & Hay, T. C. (1999). Analysis of missed cases of abusive head trauma. *JAMA, 281*(7), Article 7. https://doi.org/10.1001/jama.281.7.621

Keenan, H. T., Cook, L. J., Olson, L. M., Bardsley, T., & Campbell, K. A. (2017). Social intuition and social information in physical child abuse evaluation and diagnosis. *Pediatrics, 140*(5), Article 5. https://doi.org/10.1542/peds.2017-1188

Kratchman, D. M., Vaughn, P., Silverman, L. B., Campbell, K. A., Lindberg, D. M., Anderst, J. D., … Wood, J. N. (2022). The CAPNET multi-center data set for child physical abuse: Rationale, methods and scope. *Child Abuse & Neglect, 131*, Article 105653. https://doi.org/10.1016/j.chiabu.2022.105653

Lane, W. G., Rubin, D. M., Monteith, R., & Christian, C. W. (2002). Racial differences in the evaluation of pediatric fractures for physical abuse. *JAMA, 288*, 1603–1609. joc11721.

Laskey, A. L., Stump, T. E., Perkins, S. M., Zimet, G. D., Sherman, S. J., & Downs, S. M. (2012). Influence of race and socioeconomic status on the diagnosis of child abuse: A randomized study. *The Journal of Pediatrics, 160*(6), Article 6. https://doi.org/10.1016/j.jpeds.2011.11.042

Lindberg, D. M., Blood, E. A., Campbell, K. A., Laskey, A. L., Berger, R. P., & Examining Siblings to Recognize Abuse Study Group. 2013. Predictors of screening and injury in contacts of physically abused children. The Journal of Pediatrics, 163(3), 730-735.e1-3. https://doi.org/10.1016/j.jpeds.2013.02.051.

Lindberg, D. M., Lindsell, C. J., & Shapiro, R. A. (2008). Variability in expert assessments of child physical abuse likelihood. *Pediatrics, 121*(4), e945–e953. https://doi.org/10.1542/peds.2007-2485

Luken, A., Nair, R., & Fix, R. L. (2021). On racial disparities in child abuse reports: Exploratory mapping the 2018 NCANDS. *Child Maltreatment, 26*(3), 267–281. https://doi.org/10.1177/10775595211001926

McGuire, L., Martin, K. D., & Leventhal, J. M. (2011). Child abuse consultations initiated by child protective services: The role of expert opinions. *Academic Pediatrics, 11*(6), 467–473. https://doi.org/10.1016/j.acap.2011.06.005

Narang, S. K., Haney, S., Duhaime, A.-C., Martin, J., Binenbaum, G., de Alba Campomanes, A. G., … McGuone, D. (2025). Abusive head trauma in infants and children: Technical report. *Pediatrics, 155*(3), Article e2024070457. https://doi.org/10.1542/peds.2024-070457

Pierce, M. C., Kaczor, K., & Thompson, R. (2014). Bringing Back the social history. *Pediatric Clinics of North America, 61*(5), 889–905. https://doi.org/10.1016/j.pcl.2014.06.010

Putnam-Hornstein, E., Needell, B., King, B., & Johnson-Motoyama, M. (2013). Racial and ethnic disparities: A population-based examination of risk factors for involvement with child protective services. *Child Abuse & Neglect, 37*(1), 33–46. https://doi.org/10.1016/j.chiabu.2012.08.005

Putnam-Hornstein, E., Prindle, J. J., & Rebbe, R. (2022). Community disadvantage, family socioeconomic status, and racial/ethnic differences in maltreatment reporting risk during infancy. *Child Abuse & Neglect.* , Article 105446. https://doi.org/10.1016/j.chiabu.2021.105446

Rangel, E. L., Cook, B. S., Bennett, B. L., Shebesta, K., Ying, J., Falcone, R. A. (2009). Eliminating disparity in evaluation for abuse in infants with head injury: Use of a screening guideline. Journal of Pediatric Surgery, 44, 1229–1234; discussion 1234–5. https://doi.org/10.1016/j.jpedsurg.2009.02.044 [doi]. [pii] S0022-3468(09)00187-0.

Raz, M., Dettlaff, A., & Edwards, F. (2021). The perils of child "protection" for children of color: Lessons from history. *Pediatrics, 148*(1), Article e2021050237. https://doi.org/10.1542/peds.2021-050237

Rubin, D. M., O'Reilly, A. L., Luan, X., & Localio, A. R. (2007). The impact of placement stability on behavioral well-being for children in foster care. *Pediatrics, 119*, 336–344. https://doi.org/10.1542/peds.2006-1995

Segal, L., Armfield, J. M., Gnanamanickam, E. S., Preen, D. B., Brown, D. S., Doidge, J., & Nguyen, H. (2021). Child maltreatment and mortality in young adults. *Pediatrics, 147*(1), Article e2020023416. https://doi.org/10.1542/peds.2020-023416

Sheets, L. K., Leach, M. E., Koszewski, I. J., Lessmeier, A. M., Nugent, M., & Simpson, P. (2013). Sentinel injuries in infants evaluated for child physical abuse. *Pediatrics, 131*(4), 701–707. https://doi.org/10.1542/peds.2012-2780

Stata Statistical Software (Version Release 17).. (2021). *Computer software*. StataCorp LLC. https://www.stata.com/.

Stein, R. E., Hurlburt, M. S., Heneghan, A. M., Zhang, J., Rolls-Reutz, J., Silver, E. J., … Horwitz, S. M. (2013). Chronic conditions among children investigated by child welfare: A national sample. *Pediatrics, 131*(3), 455–462. https://doi.org/10.1542/peds.2012-1774

Strathearn, L., Giannotti, M., Mills, R., Kisely, S., Najman, J., & Abajobir, A. (2020). Long-term cognitive, psychological, and health outcomes associated with child abuse and neglect. *Pediatrics, 146*(4), Article e20200438. https://doi.org/10.1542/peds.2020-0438

Suresh, S., Heineman, E., Meyer, L., Richichi, R., Conger, S., Young, S., … Berger, R. (2022). Improved detection of child maltreatment with routine screening in a tertiary Care pediatric hospital. *The Journal of Pediatrics, 243*, 181–187.e2. https://doi.org/10.1016/j.jpeds.2021.11.073

Svedin, L., Myrup, T., & Campbell, K. A. (2021). In search of child welfare and child health Care collaboration. In , *1. Community-academic partnerships for early childhood health* (pp. 167–192). Cincinnati Press.

U.S. Department of Health and Human Services, & Administration for Children and Families. (March 22, 2024). *New data shows a consistent decrease of children in foster care* [Press release]. https://acf.gov/archive/media/press/2024/new-data-shows-consistent-decrease-children-foster-care.

U.S. Department of Health and Human Services, Administration for Children and Families, Administration of Children, Youth and Families, Children's Bureau. (2025). *Child Maltreatment 2023*. Available from https://www.acf.hhs.gov/cb/data-research/child-maltreatment Accessed 2/28/2025.

Vaithianathan, R., Jiang, N., Maloney, T., Nand, P., & Putnam-Hornstein, E. (2017). Allegheny County methodology and implementation. In Centre for Social Data Analytics (Centre for Social Data Analytics, Ed.), Developing predictive risk models to support child maltreatment hotline screening decisions. (Allegheny County Analytics).

Van Horne, B. S., Moffitt, K. B., Canfield, M. A., Case, A. P., Greeley, C. S., Morgan, R., & Mitchell, L. E. (2015). Maltreatment of children under age 2 with specific birth defects: A population-based study. *Pediatrics, 136*(6), e1504–e1512. https://doi.org/10.1542/peds.2015-1274

Williams, R. (2012). Using the margins command to estimate and interpret adjusted predictions and marginal effects. *The Stata Journal: Promoting Communications on Statistics and Stata, 12*(2), 308–331. https://doi.org/10.1177/1536867X1201200209

Wood, J. N., Campbell, K. A., Anderst, J. D., Bachim, A. N., Berger, R. P., Hymel, K. P., Harper, N. S., Letson, M., Melville, J. D., Okunowo, O., & Lindberg, D. M. (2022). Child abuse pediatrics research network: The CAPNET core data project. Academic Pediatrics, S1876-2859(22)00346–1. https://doi.org/10.1016/j.acap.2022.07.001.

Wood, J. N., Hall, M., Schilling, S., Keren, R., Mitra, N., & Rubin, D. M. (2010). Disparities in the evaluation and diagnosis of abuse among infants with traumatic brain injury. *Pediatrics, 126*(3), Article 3. https://doi.org/10.1542/peds.2010-0031

Yi, Y., Edwards, F. R., & Wildeman, C. (2020). Cumulative prevalence of confirmed maltreatment and Foster Care placement for US children by race/ethnicity, 2011–2016. *American Journal of Public Health, 110*(5), 704–709. https://doi.org/10.2105/AJPH.2019.305554

Zamalin, D., Hamlin, I., Shults, J., KatherineHenry, M., Campbell, K. A., Anderst, J. D., Bachim, A. N., Berger, R. P., Frasier, L. D., Harper, N. S., Letson, M. M., Melville, J. D., Lindberg, D. M., Wood, J. N., Sommers, S. W., Vaughn, P. (2023). Predictors of making a referral to child protective services prior to expert consultation. Academic Pediatrics, S187628592300150X. https://doi.org/10.1016/j.acap.2023.05.002.

Zolotor, A. J., & Shanahan, M. (2011). Epidemiology of physical abuse. In C. Jenny (Ed.), *Child abuse and neglect: Diagnosis, treatment, and evidence* (pp. 10–15). Elsevier Saunders.