

Critical Elements in the Medical Evaluation of Suspected Child Physical Abuse

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abstract

BACKGROUND: Previous research has described variability in medical evaluation of suspected abuse. The objective of this study was to identify, through expert consensus, required and highly recommended elements of a child abuse pediatrics (CAP) evaluation for 3 common presentations of suspected physical abuse in children aged 0 to 60 months.

METHODS: Twenty-eight CAPs recruited from 2 national organizations formed the expert panel for this modified Delphi Process. An initial survey was developed for each presentation based on demographics, history of present illness, past medical, family and social history, laboratory, radiology, and consultation elements present in at least 10% of CAP consultations collected for a larger study. CAPs ranked each element on a 9-point scale then reviewed and discussed summary results through a project blog over 3 rounds. Required and highly recommended elements were defined as elements ranked as 9 and 8, respectively, by $\geq 75\%$ of experts after the final round.

RESULTS: From 96 elements in the initial surveys, experts identified 30 Required elements and 37 Highly Recommended elements for CAP evaluation of intracranial hemorrhage, 21 Required and 33 Highly Recommended elements for CAP evaluation of long bone fracture, and 18 Required and 16 Highly Recommended elements for CAP evaluation of isolated skull fracture.

CONCLUSIONS: This guideline reflects expert consensus and provides a starting point for development of child abuse assessment protocols for quality improvement or research. Additional research is required to determine whether this guideline can reduce variability and/or improve reliability in the evaluation and diagnosis of child physical abuse.

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WHAT'S KNOWN ON THIS SUBJECT: Previous research has described important variability in the medical evaluation of suspected child physical abuse. This variability may contribute to bias and reduce reliability in the medical diagnosis of abuse.

WHAT THIS STUDY ADDS: A panel of child abuse pediatricians participated in a Delphi Process, defining critical elements for the medical evaluation of suspected physical abuse in children. Results can be used to reduce practice variability that may contribute to potential bias in evaluation.

Every year, health care providers in the United States report >150 000 children to local Child Protective Services (CPS) agencies. More than 4500 children are hospitalized with injuries due to physical abuse every year.^{1,2} Medical evaluation of suspected child physical abuse presents a unique challenge to physicians, requiring consideration of a broad differential, attention to detailed injury history, testing for occult injury, and difficult questions related to social risk factors often overlooked in the setting of acute trauma. Over the past decade, the American Academy of Pediatrics has published a series of practice recommendations for the medical evaluation of suspected child physical abuse based on expert opinion and literature review.^{3–7} The strength of evidence supporting these recommendations remains limited, however, and may contribute to variability in diagnostic evaluations.

In the absence of a perpetrator confession or eyewitness report, there is no single clinical finding that is pathognomonic for child physical abuse. The differential diagnosis for potentially abusive injuries is narrowed only through the iterative process of exclusion of alternate diagnoses that may account for the injury seen (eg, accidental injury, bleeding disorders, or metabolic bone disease) and identification of occult injuries that support a pattern of abuse (eg, healing fractures, retinal hemorrhages, or abdominal trauma). Ultimately, the diagnosis of abuse relies on summation of these different evaluations rather than confirmation of the diagnosis against an accepted gold standard. The absence of a clear end point for this process creates uncertainty about when there is sufficient medical evidence to discontinue diagnostic evaluations and accept a diagnosis of abuse.⁸ This uncertainty may be magnified by the implicit legal consequences of an abuse diagnosis. Previously published recommendations reflect this

uncertainty by providing a broad catalog of historical, laboratory, and radiographic data to be considered by physicians in the evaluation of suspected abuse.^{2–7} Without unbiased cohort data to specify critical elements of this diagnostic evaluation, a “pick-and-choose” application of these recommendations may lead to practice variability, contributing to both over- and underevaluation of children with injuries concerning for abuse.^{9–12}

In this setting of uncertainty, consensus of expert opinion can provide credible guidance for physicians involved in the medical evaluation of suspected abuse.¹³ We used a formal process of consensus guideline development to identify key history, laboratory, radiographic, and consultation elements in the initial medical evaluation of abuse. The goal for this project was to describe required and highly recommended elements of a medical evaluation for 3 common presentations of suspected child physical abuse in children aged 0 to 60 months.

METHODS

Study Design

A modified Delphi method was used to develop consensus guidelines for the initial medical evaluation of suspected child physical abuse. The Delphi method relies on an iterative process of individual survey of expert opinion, statistical summary of survey responses, and group feedback of summary statistics to achieve convergence of expert opinion for the management of a specific clinical condition.^{13–15} For this project, a blog was developed and maintained by the investigators to allow experts to complete Web-based surveys and to view statistical summaries of survey results. Experts were invited to participate in an anonymous discussion of survey results through the blog between

survey rounds. This study was reviewed and approved by the Institutional Review Board of the University of Utah.

Experts

A national panel of child abuse pediatricians (CAPs) originally recruited for a larger study related to risk perception in the evaluation of child physical abuse served as experts for this project. CAPs were recruited through the listservs of 2 professional associations: the Ray E. Helfer Society, an honorary society of physicians identified as leaders in prevention, diagnosis, treatment, and research related to child abuse and neglect, and the Section on Child Abuse and Neglect of the American Academy of Pediatrics (AAP), a self-selected society of AAP Fellows with interest in the recognition and care of child abuse and neglect.^{16,17} To be eligible to participate, interested CAPs were required to have 5 years in pediatric practice postresidency, have obtained board certification in pediatrics, spend at least 50% of their clinical time evaluating possible child abuse cases including physical abuse, and be at an institution with an institutional review board. Twenty-eight of 32 CAPs participating in the original risk perception study formed the expert panel for this Delphi process. Panelists were primarily female (82%), Caucasian, non-Hispanic (75%), and highly experienced, with most participants reporting at least 10 years of CAP practice (61%).

Injury Types

We evaluated the medical assessment of 3 injury types frequently associated with suspected child physical abuse in children 0 to 60 months of age: intracranial hemorrhage, long bone fracture, and skull fracture.

Survey Development

To develop an initial survey regarding critical elements in the initial medical evaluation of suspected child physical

abuse, we reviewed child abuse consultation notes submitted for the larger study. In the larger study, CAPs submitted completed clinical notes for physical abuse consultations selected at random from their own practice. Each expert deidentified his or her consultation notes and entered the original text into a secure, Web-based interface using a standard medical format. Laboratories, radiologic studies, and subspecialty consultations requested by the expert on initial evaluation were indicated through a checkbox process in the same interface.¹⁸

To identify an initial set of elements referenced in the medical evaluation of suspected child physical abuse, 1 author (KAC) reviewed 96 consultation notes (1 consultation note for each of 3 injury types evaluated by each of the 32 original participants). Elements of demographics, history of present illness, past medical history, family, and social history were coded based on a line-by-line reading of the consultation notes. Elements were described as “present” or “absent” for each note reviewed. For example, a note beginning with the sentence “Patient is a 6-month boy seen after a fall from a changing table at 6:15 this morning” would be coded present for the elements of child age, gender, injury mechanism, and injury timing. The element of child race, coded as present in previously reviewed consultations, would be absent unless identified elsewhere in this note. Pertinent negatives, when explicitly documented, were coded as present. A consultation noting, “History of injury has been consistent throughout hospitalization” would be coded present for the element “discrepancies in history,” whereas a consultation note that did not address historical (in)consistencies would be coded absent for this element.

The initial survey included any text element present in >10% of all

consultations reviewed, and any laboratory or radiologic studies present in >10% of consultations for each injury type. Elements of past medical history and radiologic studies were stratified by child age in the survey (<6 months, 6–11 months, 12–23 months, and 24–60 months). A single “floor” element was included in each survey to test whether experts would rank any item as “not recommended” or “inappropriate.” Due to investigator oversight, subspecialty consultations were not included in the original surveys. Questions related to subspecialty evaluations requested for diagnostic purposes (rather than treatment) in >10% of consultations for each injury type were added to a final survey round only. Using this approach, we identified 96 possible elements in the CAP evaluations of suspected child physical abuse for intracranial hemorrhage, long bone fracture, and skull fracture (Table 1).

Surveys

These elements, stratified by age when appropriate, formed the initial Web-based surveys distributed to the expert panel. Experts ranked the importance of each element using a 9-point Likert scale, with the following language provided to anchor individual responses:

- 1 (Inappropriate): This element should not be included in a CAP evaluation under almost any circumstances.
- 2–4: Presence of this element is not usual practice but remains within accepted practice.
- 5 (Optional): Presence of this element in a CAP evaluation is neither expected nor inappropriate.
- 6–8: Presence of this element is expected, but a CAP evaluation is not incomplete if it is absent.
- 9 (Required): Presence of this element is critical to a CAP evaluation.

A link to each survey was embedded within the study blog. All survey data

were collected and managed using REDCap (Research Electronic Data Capture), a secure, Web-based application designed to support data capture for research studies.¹⁹

Summary

Summary statistics for each element were calculated after each survey to describe group opinion. We constructed box plots with graphic and numeric median values, interquartile ranges, and adjacent values using Stata 12.1 (College Station, TX).

Feedback

Summarized results were posted to the blog after the first and second round of surveys. After reviewing these results, we asked experts to participate in a moderated discussion through the blog based on the following questions:

1. Were you surprised by the survey results?
2. Did you disagree with survey results?
3. How did results make you think about your own consultations?

Participation in the discussion was not required. Experts who followed the discussion without comment submission were not tracked.

Iteration

After each round, elements with complete statistical agreement and no discussion comments suggesting disagreement were removed from the survey to minimize participant burden. Elements suggested by at least 2 participants through free-text comments or blog discussion were added to the survey. After revision, links were posted on the blog to begin the subsequent cycle of survey, summary, and feedback.

Consensus Guideline Development

There is no universally recognized threshold to define consensus within a Delphi process.¹³ On the basis of the study goal of identifying critical

elements in the initial medical evaluation of child physical abuse, we relied on a conservative definition of consensus. “Required” and “Highly Recommended” elements were defined as critical elements ranked as 9 and 8, respectively, by $\geq 75\%$ of participating experts after the final round of survey, summary, and feedback. We also identified “Inappropriate” elements, defined as elements ranked as 1 by $\geq 75\%$ of participating experts after the final survey. Online discussion comments provided insight into the decision-making reflected in the process of consensus development.

RESULTS

All 28 participating experts completed 3 survey cycles, and half of the experts ($n = 14$) submitted 42 comments during discussions. There were no significant differences between participants who submitted comments and those who did not. Median rankings were generally stable over 3 survey rounds, increasing by 1 point for 17 elements and decreasing by 1 to 2 points for 21 elements across the 3 clinical scenarios.

From 96 surveyed elements, experts identified 30 Required elements and 37 Highly Recommended elements for the medical evaluation for suspected abuse in a patient presenting with intracranial hemorrhage. The expert panel also agreed on 21 Required and 33 Highly Recommended elements for the medical evaluation of suspected abuse in a patient presenting with long bone fracture, and 18 Required and 16 Highly Recommended elements for the medical evaluation of suspected abuse in a patient presenting with skull fracture (Table 2). Only the floor element (“identification of the most likely perpetrator”) was identified as “Inappropriate” for all clinical scenarios.

TABLE 1 Elements included in Delphi Method Surveys Based on Presence of the Element in at Least 10% of Child Abuse Consultation Notes or Round 1 Feedback From Expert Panel

Domain	Element
Demographics	Child age Child gender Child race/ethnicity Sources of information
History of presenting illness or injury	Injury history Symptom timeline of injury/illness Caregiver at time of injury/illness Outside or prehospital care Caregivers treatment of or response to injury/illness Discrepancies in medical history Most likely perpetrator ^a
Prenatal and perinatal history responses stratified by age	Prenatal care of mother Prenatal trauma, such as car collision or stair fall Prenatal alcohol or drug exposure Prenatal nutrition, including vitamins Planning of pregnancy Use of assisted reproductive technologies/in vitro fertilization Estimated gestational age Birth weight and/or height Birth history or complications, such as instrumentation or shoulder dystocia Perinatal care, including vitamin K Perinatal discharge timing Perinatal illness, such as sepsis Perinatal jaundice or hyperbilirubinemia Umbilical oozing, delayed umbilical separation, or other umbilical concerns Gastroesophageal reflux Newborn state screening results
Developmental and dietary history responses stratified by age	Developmental stage (rolling, crawling, cruising, or walking) Child temperament or personality traits Sleep hygiene (sleep patterns, location of sleep) Developmental concerns of parents Child diet (formula vs breastfed, vitamins, picky eater) Surgery or circumcision Easy bleeding or bruising Fracture or bony abnormality Dental malformation or abnormality Hair abnormalities (texture, fragility, or appearance) Hearing deficits Seizures or spells Complex or chronic disease Recurrent vomiting Bruises, rashes, or skin concerns Growth trajectory Well-child care Known primary care provider Immunization history Previous injuries Previous hospitalization or emergency care Medication usage
Past medical history	Bleeding or clotting problems Easy fracture or bony fragility Symptoms of osteogenesis imperfecta (eg, blue sclera, hearing loss, short stature) Genetic or metabolic disorders Collagen disorders Seizures or neurologic disorders Developmental delay or mental retardation
Family history	

TABLE 1 Continued

Domain	Element
Social history	Childhood death
	Mental illness
	Description of all child care settings
	Employment of caregivers
	Preferred language of caregivers
	Marital status of caregivers
	Parenting difficulties identified by caregivers
	Drug or alcohol abuse by caregiver
	Previous CPS involvement in household
	Abuse or neglect of child
	Abuse or neglect of caregiver
	History of legal problems or incarceration of caregivers
	Family country of origin ^b
	Economic stresses in household ^b
Laboratory studies	Complete blood count
	Basic metabolic panel
	Coagulation screening (PT/PTT/INR)
	Hepatic transaminases (alanine transaminase/aspartate aminotransferase)
	Pancreatic enzymes (amylase/lipase)
	Serum albumin
	Calcium/phosphorus
	Alkaline phosphatase
	Magnesium
	Urinalysis
	Von Willebrand's panel ^c
	Fibrinogen/D-dimer ^c
	Factors VIII, IX ^c
	Factor XIII ^c
	Urine organic acids/serum amino acids ^c
	Osteogenesis imperfecta testing ^d
	Parathyroid hormone ^d
	Vitamin 25 hydroxyvitamin-D ^{d,e}
Radiologic studies responses stratified by age	Head computed tomography
	Skeletal survey
	Neck and/or spine imaging
	Abdominal computed tomography
	Cranial magnetic resonance imaging ^c
	Focused extremity films ^d
	Focused skull series ^e
	Pediatric ophthalmology ^f
Consultations responses stratified by age	

All elements were included on initial survey for all injury types, with the exceptions noted in footnotes c, d, and e. PT/PTT/INR, prothrombin time/partial thromboplastin time/international normalized ratio.

^a Included by investigators to test floor response of experts participating in Delphi.

^b Added to survey after round 1 survey, summary, and feedback.

^c Included on intracranial hemorrhage survey.

^d Included on long bone fracture survey.

^e Included on skull fracture survey.

^f Added after round 2 survey, summary, and feedback.

Despite the statistical stability of expert opinion over survey rounds, online discussion of results reflected recent changes in CAP research and practice. One expert referenced a new AAP practice guideline, “The Factor XIII issue [ordering Factor XIII levels for intracranial hemorrhage] is interesting in light of the recently

suggested heme workup paper in the setting of head trauma.”³ Another commented, “Ever since Dan Lindberg’s study, I am getting liver enzymes on all my isolated fracture cases.”²⁰ Some were surprised by practices recommended by other participants, including, “Neck imaging in children with head injury ... is this

something that everyone is already doing?”²¹ Participants also considered the role of CAP evaluations in future research: “In regard to race/ethnicity, how great would it be for research if all CAP reports had this available. That is why I switched to a 9 [Required].”⁹⁻¹¹ Others disagreed, arguing, “with the possible exception of looking for a genetic disease/cause of bleeding for ICH cases, I do not think documentation of race is necessary or even ‘recommended’ in cases of child abuse.”

The balance between over- and underevaluation was a common theme. One participant acknowledged, “I have varied feelings about obtaining a detailed social history with questions about risk factors. It’s good to know this information, but will it bias my decision? Risk factors apply to populations rather than to individual cases.” Others argued that identification of social risk was necessary for longitudinal care of children at high risk. One participant expressed disappointment “that many elements of the psychosocial history were not required. I wonder if it is because some clinicians are seeing these children only in the acute setting ... [others are] in a position to make recommendations to CPS to address the psychosocial concerns.” Finally, experts struggled with boundaries between clinical and forensic practice in CAP evaluations. Arguing in support of laboratory studies for unlikely diagnoses, one participant explained, “The number of labs ordered depends very much on the local environment and how vigorous the defense attorneys are. There are some I know that order everything on every kid they see as a preemptive strike. Once burned, twice shy.”

DISCUSSION

Through a modified Delphi process, we developed consensus guidelines for required and highly recommended

TABLE 2 Required and Highly Recommended Elements in the Medical Evaluation for Suspected Child Abuse

Domain	Consensus	Injury type		
		Intracranial hemorrhage	Long bone fracture	Skull fracture
History of presenting illness	Required	Child age, source of history, injury history, symptom timeline, caregiver present at time of injury or illness	Child age, source of history, injury history, symptom timeline, caregiver present at time of injury or illness, caregiver response to symptoms, outside hospital or prehospital medical care	Child age, source of history, injury history, symptom timeline, caregiver present at time of injury or illness, caregiver response to symptoms, outside hospital or prehospital medical care
	Highly recommended	Caregiver response to symptoms, outside hospital or prehospital medical care, discrepancies in history	Discrepancies in history	Discrepancies in history
Past medical history	Required	Past injuries, surgeries, easy bleeding, seizures, skin concerns, special health care needs	Past injuries and fractures	Past injuries and fractures
	Highly recommended	Past Fractures, vomiting, growth pattern, known primary care provider, hospitalizations, medications	Dental concerns, hearing loss, skin concerns, growth pattern, hospitalizations, medications, special health care needs	Skin concerns, growth pattern, hospitalizations, special health care needs
Pre- and perinatal history (infants <6 mo of age unless otherwise specified)	Required	Estimated gestational age, birth complications, perinatal care (eg, vitamin K)	Estimated gestational age, birth complications	Birth complications
	Highly recommended	Prenatal care, prenatal injury, prenatal drug exposure, estimated gestational age, ^a birth weight, birth discharge timing, perinatal care (eg, vitamin K), ^a perinatal illness, neonatal state screen	Prenatal care, prenatal nutrition, estimated gestational age, ^a birth weight, perinatal illness	Prenatal care, prenatal injury, estimated gestational age, birth weight
Developmental history	Required	Developmental stage	Developmental stage	Developmental stage
	Highly recommended	Parental concerns for development	Parental concerns for development	Parental concerns for development
Dietary history	Required	N/A	Diet (eg, breast vs formula fed; vitamins given; picky eater) ^b	N/A
	Highly recommended	N/A	Diet (eg, breast vs formula fed; vitamins given; picky eater) ^{a,c,d}	N/A
Family history	Required	Easy bleeding or known bleeding disorder	Bone fragility, osteogenesis imperfecta	Bone fragility
	Highly recommended	Metabolic disorder, seizures, early childhood deaths, mental illness	Metabolic disorders, collagen disorders	Osteogenesis imperfecta, metabolic disorders, collagen disorders
Social history	Required	Description of child care settings	N/A	Description of child care settings, previous abuse/neglect of this child
	Highly recommended	Previous abuse/neglect of this child, intimate partner violence, caregiver history of abuse/neglect, past CPS involvement for household	Description of child care settings, previous abuse/neglect of this child, parenting difficulties, intimate partner violence, caregiver history of child abuse/neglect, past CPS involvement for household, past legal involvement of caregiver	Intimate partner violence, caregiver history of abuse/neglect, past CPS involvement for household

TABLE 2 Continued

Domain	Consensus	Injury type		
		Intracranial hemorrhage	Long bone fracture	Skull fracture
Laboratory	Required	Complete blood count, coagulation screening (PT/PTT), liver enzymes (ALT/AST)	N/A	N/A
	Highly recommended	Basic metabolic panel, pancreatic enzymes (amylase/lipase)	Alkaline phosphatase, calcium/phosphorous	N/A
Radiology	Required	Head CT, ^{a,b,c} skeletal survey ^{a,b,c}	Head CT, ^b skeletal survey ^{a,b,c}	Head CT, ^a skeletal survey ^a
	Highly recommended	Head CT, ^d brain MRI	Focused extremity	N/A
Consultations	Required	Pediatric ophthalmology ^{a,b}	N/A	N/A
	Highly recommended	Pediatric ophthalmology ^{c,d}	N/A	N/A

Expert consensus for evaluation of suspected physical abuse in children aged 0 to 60 mo unless indicated by footnotes. N/A, no elements were identified by expert consensus. ALT/AST, alanine transaminase/aspartate aminotransferase; CT, computed tomography; MRI, magnetic resonance imaging; PT/PTT, prothrombin time/partial thromboplastin time.

- ^a In children aged 6–11 mo.
^b In children aged <6 mo.
^c In children aged 12–23 mo.
^d In children aged 24–60 mo.

historical elements, laboratory studies, radiologic examinations, and subspecialty consultations for the initial medical evaluation of suspected child physical abuse in children 0 to 60 months of age presenting with intracranial hemorrhage, long bone fracture, or skull fracture. Panel discussions during guideline development reflect familiarity with published recommendations, awareness of emerging research, and mindfulness related to potential bias in the diagnostic evaluation of suspected child physical abuse.

The complexity involved in medical evaluation of suspected abuse is captured by the extensive historical information either required or highly recommended by the expert panel. Historical elements in the consensus guideline align substantially with available practice guidelines.⁶ Although many of these elements are expected with any medical evaluation, other elements, such as source of history, caregiver present at the time of injury, caregiver’s response to symptoms, and changes or discrepancies in the history provided, reflect the unique character of CAP evaluations. In contrast to traditional pediatric practice, CAPs recognize the potential misalignment of caregiver

and physician goals in reaching the “correct” diagnosis for a child. Broad inclusion of elements from the medical, developmental, and family history reflect the wide differential diagnosis entertained in cases of suspected abuse.

The laboratory studies, radiologic examinations, and subspecialty consultations identified as either required or highly recommended in the initial evaluation of suspected abuse are also consistent with published guidelines and reflective of recent research. In the setting of intracranial hemorrhage, screening studies for coagulation disorders and for occult abdominal trauma are required, whereas basic laboratory studies for bone health are required in cases of long bone fracture.^{3,6,19,22,23} Similarly, radiologic recommendations are consistent with research supporting skeletal surveys for children under 2 years of age with suspected abusive head trauma or abusive long bone fracture but limited to children under 6 months of age presenting with skull fracture.^{5,22,24,25} Discrepancies between this consensus guideline and previously published clinical practice recommendations may reflect changing or conflicting recommendations, as seen in the

discussions related to choices of laboratory tests for coagulation disorders and occult abdominal injury in children with suspected physical abuse, or a prioritization of elements identified as most critical to initial evaluation of an injury.

The expert panel did diverge importantly from published practice guidelines in identification of psychosocial elements critical to the initial medical evaluation of suspected abuse.^{6,26} Few elements in the social history were required. Description of all child-care settings, required in the evaluation of intracranial hemorrhage and skull fracture, serves as a clarification of the source of the presenting history and whether other caregivers may have additional injury or symptom history. A past history of child abuse or neglect in the home, required only in cases of skull fracture, reflects research suggesting that this may serve as an effective risk indicator in initial evaluation of these children.²⁷ Almost all elements in the psychosocial history identified as highly recommended relate directly to the presence or absence of violence in the home, a risk factor for abuse as well as a potential injury mechanism.^{28,29} Missing from the list of required and recommended

elements are descriptions of caregiver mental health, substance abuse, pregnancy planning, and parent perceptions of child temperament or behavior, all of which have been recommended in clinical practice recommendations.^{5,6} The importance of these psychosocial elements was a focus of discussion between survey rounds. Experts worried about narrowing a medical evaluation to exclude elements that might help to reduce future adversities for the child and family, yet acknowledged the potential for bias introduced by the psychosocial history.^{9–12} The final consensus guideline reflects uncertainty regarding the reliability of these psychosocial factors in shaping early diagnostic decisions.

This study must be viewed in light of its limitations. Although drawn from national CAP listservs, the expert panel may not be representative of the wider CAP community. Consensus opinion does not reflect actual practice, which may vary across institution, provider, and patient.

Consensus opinion also may not be correct, and opinion may change as scientific truths emerge over time. This consensus guideline addresses only required and highly recommended elements in the initial evaluation of suspected abuse. It does not inform secondary evaluations in response to findings of occult injury or anomalous laboratory results and does not suggest that other elements should be excluded from any evaluation. Finally, sensitivity to potential medicolegal implications of a consensus guideline for medical evaluation of suspected physical abuse may have reduced the willingness of panel members to identify elements as either required or inappropriate. Panel discussions between survey rounds reflected each of these limitations.

As a new subspecialty, CAP providers have a unique opportunity to define appropriate practices that best balance the goals of traditional pediatrics with the emerging expectations of forensic evaluation.

Despite limitations, these consensus guidelines may provide a useful starting point for development of a checklist child abuse assessment protocol for quality improvement or research efforts in the future. Additional research is required to determine whether these consensus guidelines can reduce previously described variability, decrease potential bias, and/or improve reliability in the evaluation and diagnosis of child physical abuse.

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ABBREVIATIONS

AAP: American Academy of Pediatrics
 CAP: child abuse pediatrician
 CPS: Child Protective Services

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