Signals in the hospital Emergency Room linking objective signs to child abuse knowledge

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Chapter 7

Screening methods to detect child maltreatment: high variability in Dutch emergency departments

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Abstract

*Background* - In the Netherlands, screening for child maltreatment is mandatory in all emergency departments, but it is unclear which screening methods are being used. To take a 1st step toward implementation of a universal screening method across all emergency departments, we assessed the currently used screening methods.

*Objective* - To provide an overview of the screening methods for child maltreatment across all emergency departments in the Netherlands and to assess their empirical substantiation.

*Methods* - We surveyed all emergency departments in the Netherlands, using a questionnaire on screening methods. All screening checklists used in emergency departments were assembled and compared to the literature.

*Results* - 85 hospitals with an emergency department were approached, 80 completed the questionnaire and 77 provided copies of their screening checklists. All participating hospitals use a screening checklist, 41% a screening physical examination, 60% a screening based on parental risk factors and 3% a retrospective review of all charts. The empirical substantiation for these screening methods is largely lacking, and at least 73% of the hospitals use a checklist that has not been reported in literature.

*Conclusions* - Large variations in screening methods exist across emergency departments in the Netherlands, most of which are not based on empirical evidence.
Screening methods to detect child maltreatment: high variability in Dutch emergency departments

Introduction
Child maltreatment is a worldwide social and medical problem with many short and long term adverse consequences, such as mental and medical health problems. To allow adequate intervention aimed to improve the patient’s situation, and to prevent recurrence, detection of child maltreatment is essential.

Emergency departments are main entrances to the healthcare system, and are appropriate settings for early detection of child maltreatment. However, several studies have shown that child maltreatment is under-detected at emergency departments. If child maltreatment detection at emergency departments could be improved, short and long-term mental and medical health consequences might be at least partly prevented.

A number of screening methods have been proposed to improve detection of maltreatment in children visiting emergency departments, such as the use of checklists, universal screening physical examinations and specific training of personnel. The Dutch Health Care Inspectorate made screening for child maltreatment compulsory in emergency departments in early 2009. However, since no specific screening method is required, it is unclear which screening methods for child maltreatment are used across different emergency departments in the Netherlands. If practice variation in screening methods exists, this could lead to unwanted variation in outcome. As a first step toward implementation of a universal screening method across all emergency departments, we assessed the currently used screening methods.

Across all emergency departments in the Netherlands, we surveyed the hospital staff and compared the reported screening methods with the literature to assess empirical substantiation. Specifically, we addressed the following research questions: (1) What screening methods for child maltreatment are used across emergency departments in the Netherlands? (2) What is the empirical substantiation of those screening methods? (3) How is the influence of the Dutch Health Care Inspectorate on screening for child maltreatment in the emergency department perceived by hospital staff members?

Methods
Study design
We conducted a survey across all hospital emergency departments accessible for children in the Netherlands between 1 November 2012 and 12 March 2013. A list of eligible hospitals was derived from a report of the Dutch Health Care Inspectorate concerning child maltreatment. Subsequently, we searched the literature to assess empirical substantiation of the reported screening methods.
Chapter 7

Questionnaire

An English translation of the questionnaire is shown in online supplementary appendix 1. The questionnaire contained the following items:

1. Contact information: for all respondents the function in their respective organization was recorded.
2. The number of clinical hospital beds.
3. The number of patients (adults and children) visiting the emergency department annually.
4. The number of children (aged 0-17) visiting the emergency department annually.
5. The presence of a screening method for children visiting the emergency department and, if so, what screening method, the start date and patient selection and percentage of children screened.
6. The presence of a screening method based on parental risk factors—for example, parents visiting the emergency department because of intimate partner violence or substance abuse and, if so, the percentage of parents screened.
7. The perceived influence of the Dutch Health Care Inspectorate (who made screening for child maltreatment compulsory in emergency departments in early 2009). The respondents were asked to score this item as: positive (ie, stimulating), neutral, or negative.
8. Scheduled changes in child maltreatment screening methods (the results of this item are not reported, because they are not relevant for this article).

Data collection

All emergency departments were approached by telephone, and the investigators (EMMHvK, SAZ) asked to be connected with a staff member with knowledge about the policy concerning child maltreatment. Depending on the preference of this respondent, the questionnaire was administered via a telephone survey, or it was sent by email/mail to be filled out later. All respondents were also asked to return a copy of their screening checklists. To optimize response rates, written and telephone reminders to return the questionnaires and the screening checklists were scheduled every 2 weeks. Once the information on the screening methods was received, the literature was searched for any studies reporting on the effectiveness of those methods.

Data analyses

Hospitals with multiple emergency departments were analyzed as one hospital if the exact same child maltreatment policy was used across all locations. All screening methods were read, categorized and entered into SPSS databases (IBM SPSS Statistics 20) by 2 investigators together (EMMHvK and SAZ). Screening methods were first categorized based on: the name of the method if it was reported in the literature or ‘other’ if the method was not reported in the literature. Screening methods were also categorized based on age of the children screened and selection of screened children (eg, only children presenting with...
Screening methods to detect child maltreatment: high variability in Dutch emergency departments

Thereafter, items of screening checklists were compared with checklists reported in the literature on a point-by-point basis. Only descriptive analyses were applied. Non-normal distributed continuous variables are presented as median (range).

Results
According to the Dutch Ministry of Health, Welfare and Sports, in 2012 there were 91 hospitals in the Netherlands. Following a report of the Dutch Health Care Inspectorate, a total of 85 eligible hospitals were approached of which, after several reminders, 80 hospitals (94%) completed the questionnaires (6 by telephone and 74 by (e)mail); 77 hospitals (91%) provided copies of their screening checklists.

Characteristics of respondents and hospitals
Respondents who filled out the questionnaires consisted of pediatricians, emergency department nurses, emergency physicians and other staff members (such as a pediatric nurse or child psychologist) involved in child maltreatment teams. The participating hospitals ranged from small regional hospitals (minimum 147 clinical beds) to large academic teaching hospitals (maximum 1339 clinical beds), with a median of 450 clinical beds. The five non-responding hospitals had between 197 and 510 clinical beds, and were all non-academic. The annual number of children visiting the emergency department varied between 1150 and 31,000, but data were missing for 26 of the participating hospitals.

Screening methods
All 80 participating hospitals used a screening method for child maltreatment at their emergency department. Screening methods consisted of one or more of the following screening instruments: checklists in all emergency departments (100%); screening physical examinations in 33 emergency departments (41%), a screening based on parental risk factors in 48 emergency departments (60%); and a retrospective review of all charts (a child maltreatment specialist reviews the charts of all visiting children for any signs of child maltreatment that were overlooked by emergency staff) in two emergency departments (3%). Seventy-one emergency departments used a checklist in all children (89%), seven used a checklist only in children presenting with an injury (9%) and two used a checklist only when there was a clinical suspicion of child maltreatment (3%). Different emergency departments screened children in different age categories (Table 1).

We do not know which percentage of children and parents were effectively screened, because the answers to these questions were of insufficient quality for any analysis.

Checklists
Although all participating hospitals used a screening checklist in all children or in a selected group of children presenting at the emergency department, there was a large variation in the checklists used. Of all hospitals that provided checklists, 21 used a checklist that...
has been reported in the literature (27%). The SPUTOVAMO checklist\textsuperscript{17,18} was used in 12 hospitals (16%); the ESCAPE Form\textsuperscript{13} was used in 6 hospitals (8%) and the SPUTOVAMO-R checklist\textsuperscript{12} was used in 3 hospitals (4%) (see online supplementary appendices 2-4). The other 56 hospitals (73%) used modified versions of the above checklists or another checklist that has not been reported in literature. Two hospitals reported using the Benger-pediatric flow chart, but their checklists were different from the original Benger flow chart\textsuperscript{19} (see online supplementary appendix 5) and have been categorized as ‘other’.

**Items on screening checklists**

Twenty-eight hospitals (35%) used a two-step screening approach: a limited pre-screening checklist in all children followed by an extended list if one item on the pre-screening checklist was positive or if there was a clinical suspicion of child maltreatment. In total, 28 different items were identified in the screening checklists, of which 12 were not part of any of the four checklists reported in the literature (table 2).\textsuperscript{12,13,17,19} Of these 28 items, 8 items (at least one item used in all emergency departments) were related to parental behavior, 5 items (at least one item used in 76 emergency departments) to an unclear history and 5 (at least one item used in 71 emergency departments) to characteristics of an injury.

### Table 1. Screening methods applied in children visiting Dutch emergency departments: results of 80 hospitals

<table>
<thead>
<tr>
<th>Screening instrument</th>
<th>For all children presenting at the emergency department</th>
<th>Only for children presenting at the emergency department with an injury</th>
<th>Only when clinical suspicion of child maltreatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Checklist</strong></td>
<td>Age 0-16</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Age 0-17</td>
<td>58</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>71</td>
<td>7</td>
</tr>
<tr>
<td><strong>Complete physical examination</strong></td>
<td>Age 0-4</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Age 0-6</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Age 0-10</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Age 0-11</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Age 0-12</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Age 0-16</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Age 0-17</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>29</td>
<td>4</td>
</tr>
<tr>
<td><strong>Screening based on parental risk factors</strong></td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Retrospective chart review</strong></td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

148
Table 2. Items on the screening checklists used in children visiting Dutch emergency departments: results of 77 hospitals

<table>
<thead>
<tr>
<th>Item on checklist</th>
<th>For all children presenting at the emergency department</th>
<th>Only for children presenting at the emergency department with an injury</th>
<th>Only when clinical suspicion of child maltreatment or positive item on previous checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absolute number of hospitals (%)</td>
<td>Absolute number of hospitals (%)</td>
<td>Absolute number of hospitals (%)</td>
</tr>
<tr>
<td>History and examination do not match</td>
<td>57 (74)</td>
<td>9 (12)</td>
<td>4 (5)</td>
</tr>
<tr>
<td>Inappropriate parental actions after medical problem</td>
<td>43 (56)</td>
<td>7 (9)</td>
<td>12 (16)</td>
</tr>
<tr>
<td>Unexplained injuries</td>
<td>28 (36)</td>
<td>7 (9)</td>
<td>27 (35)</td>
</tr>
<tr>
<td>Clinical suspicion of abuse</td>
<td>34 (44)</td>
<td>6 (8)</td>
<td>17 (22)</td>
</tr>
<tr>
<td>Witness/parents do not accompany child</td>
<td>23 (30)</td>
<td>5 (7)</td>
<td>23 (30)</td>
</tr>
<tr>
<td>Injury does not match given time period</td>
<td>23 (30)</td>
<td>7 (9)</td>
<td>20 (26)</td>
</tr>
<tr>
<td>Unexplained anatomical location for injury</td>
<td>29 (38)</td>
<td>6 (8)</td>
<td>13 (17)</td>
</tr>
<tr>
<td>Perpetrator does not accompany child</td>
<td>17 (22)</td>
<td>5 (7)</td>
<td>25 (33)</td>
</tr>
<tr>
<td>Unusual appearance of injury</td>
<td>21 (27)</td>
<td>5 (7)</td>
<td>20 (26)</td>
</tr>
<tr>
<td>Inconsistent history</td>
<td>37 (48)</td>
<td>5 (7)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Delay in attendance</td>
<td>32 (42)</td>
<td>3 (4)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Unusual parent-child interaction</td>
<td>28 (36)</td>
<td>3 (4)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Clinical suspicion of neglect</td>
<td>14 (18)</td>
<td>0 (0)</td>
<td>18 (23)</td>
</tr>
<tr>
<td>Unusual behavior of child/parents</td>
<td>25 (33)</td>
<td>2 (3)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Frequent prior attendance</td>
<td>18 (23)</td>
<td>1 (1)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>History is inconsistent with developmental level of child</td>
<td>18 (23)</td>
<td>3 (4)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Child maltreatment (suspect) in history</td>
<td>14 (18)</td>
<td>3 (4)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>History given by child does not match history given by parents</td>
<td>12 (16)</td>
<td>3 (4)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Head injury or fracture in child &lt;1 year</td>
<td>8 (10)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Unusual contact parents/child with hospital staff</td>
<td>6 (8)</td>
<td>1 (1)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Other risk factors for child maltreatment</td>
<td>2 (3)</td>
<td>0 (0)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Other child is blamed for medical problem</td>
<td>2 (3)</td>
<td>2 (3)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Unexplained symptoms</td>
<td>2 (3)</td>
<td>1 (1)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Language barrier</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Details in family situation</td>
<td>1 (1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Disagreement between nursing and medical staff on suspected child maltreatment</td>
<td>1 (1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Inappropriate parental intervention to prevent medical problem</td>
<td>1 (1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Insufficient involvement of parents with child’s health</td>
<td>1 (1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

Question related to:
1. Unclear history (5 questions)
2. Parental behavior (8 questions)
3. Characteristics of an injury (5 questions)

Question found in:
S ‘SPUTOVAMO’ checklist
E ‘ESCAPE Form’
SR ‘SPUTOVAMO-R’ checklist
B ‘Benger flow chart’
**Screening based on parental risk factors**

Forty-eight emergency departments used a screening based on parental risk factors to identify child maltreatment. Using this screening method, all adults visiting the emergency department because of intimate partner violence, substance abuse or a suicide attempt were asked whether they had children in their care. If so, all these children were referred for further child maltreatment investigations, either to the Child Abuse Counselling and Reporting Centre (23 emergency departments), a child maltreatment committee within the hospital (13 emergency departments), a pediatrician (5 emergency departments), the Bureau for Youth Care (5 emergency departments) or to another youth care organization (2 emergency departments).

**Substantiation of screening methods**

The validity of the SPUTOVAMO and the SPUTOVAMO-R checklists has not yet been evaluated\(^20,21\), although research to determine diagnostic accuracy of both checklists is currently being performed (Teeuw, personal communication, 2013).\(^12\) A recent study, evaluating the effectiveness of the ESCAPE Form, showed that screening was effective in increasing the detection rate of suspected child maltreatment as confirmed by an expert panel from 0.1% to 0.5%.\(^13\) However, the proportion of children with a false negative screening result remains unknown.

The positive predictive values of the different individual items on screening checklists for child maltreatment have been poorly studied.\(^12,20,21\) Woodman et al\(^11\) reviewed the evidence for the association between several characteristics and physical child abuse in injured children at the emergency department. They conclude that none of the characteristics (age, repeat (prior) attendance and type of injury) were accurate enough to detect child maltreatment.\(^11\) There were insufficient studies to review any other items, such as severity of the injury, delay in attendance and inconsistent history.\(^11\) The authors state that the most effective screening items would be to refer all severely injured infants (injury in child < 1 year) and all social work active children (child maltreatment (suspicion) in history).

There has been no evaluation of the diagnostic accuracy of a screening physical examination for child maltreatment. Diagnostic accuracy of screening based on parental risk factors has not been reported yet, but is currently under investigation.\(^22,23\) Woodman et al\(^20\) reviewed the validity of a retrospective chart review by a community liaison nurse and found only one unpublished study, showing weak evidence for increased detection of true and false positive cases of child maltreatment.

**Perceived influence of the Dutch Health Care Inspectorate**

Sixty-seven participating hospitals (84%) indicated that the influence of the Dutch Health Care Inspectorate (who made screening for child maltreatment in emergency
departments compulsory in early 2009) on screening methods for child maltreatment at the emergency department had been perceived as stimulating in a positive way. Twelve hospitals (15%) indicated that they had not perceived any influence (neutral). The result for one participating hospital is unknown. None of the participating hospitals indicated that they had perceived the influence as non-stimulating or even, negative.

Discussion
As expected, all hospitals participating in this study use a screening method for child maltreatment in the emergency department. However, 11% of the hospitals do not screen all children, but only those presenting with an injury (9%) or when maltreatment is suspected (3%). All hospitals use a checklist, 41% a physical screening examination, 60% use a screening method based on parental risk factors and 3% a retrospective review of all charts. Items on screening checklists vary widely. In total, 28 different items were identified and no item was used in all checklists.

The empirical substantiation for the screening methods used is largely lacking. Some evidence is only available to substantiate the ‘ESCAPE Form’ (used in 6 hospitals) and a retrospective chart review (used in two hospitals). Only 27% of the hospitals use a checklist for which we were able to retrieve any information in the literature. It is unclear to us why the majority of the hospitals are using a checklist that has not been reported in the literature, and we do not know how those checklists have been developed. Screening methods based on parental risk factors have been widely implemented during the past 5 years in the Netherlands, even though empirical substantiation is still lacking. However, studies are currently being performed, and we expect information on diagnostic accuracy to become available in the future.

In 2007, a survey across emergency departments in England and Northern Ireland showed a wide variation in child protection protocols. This is similar for the current situation in the Netherlands. As a result of the differences in screening methods, screening results of children with a similar condition might vary between hospitals. It is tempting to assume that hospitals with a more comprehensive screening method will identify more child maltreatment; however, this cannot be substantiated since comparative studies on the diagnostic accuracy of different screening methods are not available. However, policy makers should be aware of the different screening methods that are currently in use, because there are several potential benefits to the systematic use of one screening method in all emergency departments. First, increased familiarity with a universal screening method could enhance compliance of hospital staff. Because there are often rapid changes in emergency department staffing, it can be difficult to organize sufficient and timely training in screening methods. If all emergency departments used the same screening method it would not matter if personnel changed hospitals and, furthermore, this screening method could be taught during initial training. Second, comparable
screening outcomes across hospitals would be available—that is, number of positive screening tests (suspected child maltreatment) and child maltreatment confirmed by a reference standard (since a true ‘gold standard’ is lacking in child maltreatment, derived reference standards such as child protection reports have to be used). These comparable outcomes can increase possibilities to uphold implementation of the screening method and, consequently, to perform scientific research. The influence of the Dutch Health Care Inspectorate on screening for child maltreatment at the emergency department is rated as stimulating by a large majority of the participating hospital staff members. This suggests that the Health Care Inspectorate could play a role in further implementation of a universal screening method.

**Strengths and limitations**
The main strength of this survey is the high rate of participation (over 90%), ensuring that the results are representative of the situation in the Netherlands. Furthermore, because all original screening checklists were assembled, we were able to evaluate the items on those checklists comprehensively. The most important limitation is that reported screening methods were not compared to effectively executed methods. We therefore do not know what the actual compliance with the reported screening methods.

**Recommendations**
For clinical practice, we recommend that one screening method for child maltreatment is used across all emergency departments in the Netherlands. At this point, there is insufficient evidence to choose one particular method. Future research should focus on comparing the diagnostic accuracy and the balance between burden and benefit of different screening methods for child maltreatment.

**Conclusion**
All Dutch emergency departments use a screening method for child maltreatment but large variations exist. The majority of these screening methods are not substantiated by empirical evidence.

**Competing interests**
The authors report no competing interests.

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152
REFERENCES


