

Article

Addressing the Clinical Burden of Child Physical Abuse and Neglect in a Large Metropolitan Region: Improving the Evidence-Base

Shanti Raman ^{1,*}, Michelle Maiese ^{2,†}, Katrina Hurley ^{3,†} and David Greenfield ^{4,†}

¹ Western Clinical School, University of New South Wales, Liverpool Hospital, Liverpool, NSW 2170, Australia

² Child Protection, Sydney Local Health District, Croydon Health Centre, 24 Liverpool Road, Croydon, NSW 2132, Australia; E-Mail: michelle.maiese@sswahs.nsw.gov.au

³ Child, Youth, Women and Families Health, South Eastern Sydney Local Health District, GPO Box 1614, Sydney, NSW 2001, Australia; E-Mail: Katrina.hurley@sesiahs.health.nsw.gov.au

⁴ Australian Institute of Health Innovation, University of New South Wales, Sydney, NSW 2052, Australia; E-Mail: d.greenfield@unsw.edu.au

† These authors contributed equally to this work.

* Author to whom correspondence should be addressed; E-Mail: s.raman@unsw.edu.au; Tel.: +61-2-8738-4844; Fax: +61-2-8738-4800.

External Editor: Nigel Parton

Received: 23 July 2014; in revised form: 8 October 2014 / Accepted: 8 October 2014 /

Published: 20 October 2014

Abstract: Children at risk of abuse are more likely to be hospitalized and utilize health services according to international research. In a large metropolitan health region in New South Wales, Australia, there was little known of the clinical burden of child physical abuse and/or neglect (PAN), or of systems for clinical assessment of children presenting with abuse/neglect. We aimed to identify the number of children presenting with suspected PAN to emergency departments (EDs) and paediatric services in this region, to determine enablers and barriers to assessment for children with PAN presenting to frontline services, and to identify best practices to address gaps. We collated available data on children presenting to EDs and paediatric services with suspected PAN in 2007. We interviewed 36 health professionals from nine hospitals and 12 statutory child protection professionals, across the region before undertaking relevant document analysis. Of 64,700 paediatric ED

presentations, a quarter were due to injury; 2%–5% of these were due to maltreatment. Clinician estimates and assessments of PAN varied widely; health and welfare workers identified major practice gaps, as well as good local practice. We identified feasible minimum standards for improving clinical assessment and follow-up for children presenting with PAN, given the right organizational support.

Keywords: child abuse and neglect; child maltreatment; quality improvement; audit; health services; emergency health services; child welfare; systems improvement

1. Introduction

Child maltreatment (CM) is a major public health problem the world over [1–3]. In Australia, as with many nation states in the western world, CM is periodically the focus of sensationalist media attention and public outcry. In New South Wales (NSW), the state with the largest number of reported CM cases in Australia, a far-reaching review of child protection systems was carried out in 2008 and recommended major changes in the ways CM was responded to across agencies, including health services [4]. The NSW government's response to the child protection review, promised a greater shared responsibility for ensuring the wellbeing of children at risk, a major component of this responsibility resting on health services [5]. We know maltreated children are at risk of adverse health consequences [6], they are also more likely to be hospitalized and utilize more health services [7]. While systems to support the recognition of and response to CM are crucial, numerous studies in western countries have documented that CM is poorly reported and counted in healthcare administrative systems [8].

Several international studies have shown that children who have experienced abuse are often seen in an emergency department (ED) before the diagnosis of the abuse is made [9–11]. The authors of the six-country study on CM trends and policies which included Australian data, argue that there needs to be much better recording and analysis of CM data, including record linkages between hospital admissions and child protection services, as such data can provide valuable information about cumulative risk of maltreatment-related hospital admission, or contact with child protection agencies [12]. A seemingly obvious intervention would be effective screening for CM in EDs; however, the Cochrane review on interventions in EDs to increase detection of confirmed child abuse found that there was inconclusive evidence on effectiveness due to the scarcity of quality studies [13]. There have been many attempts to improve clinicians' performance in EDs with respect to CM [14,15]; Woodman *et al.*'s review suggested that none of the markers (infancy, type of injury, repeated attendance) were sufficiently accurate to screen injured children in the ED to identify those requiring paediatric assessment for possible PAN. They concluded that clinicians should be aware that among injured children at ED a high proportion of abused children will present without these characteristics and a high proportion of non-abused children will present with them, suggesting comprehensive assessment rather than screening as the appropriate modality [16]. A large-scale Dutch intervention study looking at improving detection rates among doctors and nurses in ED found that ED staff experienced many barriers, particularly communication with parents of children suspected of being abused [17]. Few

studies have looked beyond systems of identification in acute health services to actually improving systems of care and follow-up of abused children in a holistic manner. While there are many studies reporting wide variations in reporting CM concerns by different professional groups [18], there has been little attention paid to the inter-disciplinary professional practice in clinical assessment of CM for example.

In a large metropolitan health region in NSW, with a substantial child and youth population that is culturally diverse and has significant sub-populations at social and economic risk within its boundaries [19], there were no epidemiological or health services data available on how many acute presentations of child physical abuse and/or neglect (PAN) were managed across hospital systems. Anecdotal reports suggest that there are high-risk localities within the region with disproportionately high numbers of child protection reports. In 2009, following directly the NSW government response to the child protection reforms, a quality improvement project was undertaken to determine the clinical burden of child PAN in this region, and to examine the assessment and care for children and young people presenting with suspected maltreatment to frontline clinical services. Prior to the project commencing, there was no clear understanding or documentation of what capacity there was within frontline clinical services to conduct or manage PAN assessments. Specifically, we aimed to quantify the number of suspected child PAN presentations to EDs and paediatric services, determine the current systems and processes for assessment and care of suspected PAN within frontline clinical services—including identifying enablers and barriers—and to develop feasible strategies to address the identified gaps.

2. Methods

This was a multi-method study; the data collection methods were secondary document analysis and semi-structured interviews allowing triangulation of findings [20].

From each of the nine hospitals in this health region with EDs where children and young people can be assessed and managed, we obtained estimates from the Clinical Information Departments, of children (under 16 years) seen with suspected PAN through 2007. These hospitals are all district level hospitals for paediatrics serving local populations that are quite distinct; three of them are tertiary teaching hospitals. All acute presentations are to EDs. We therefore analysed only data collected in EDs. Data was extracted by a data analyst from the Clinical Information Department of the largest hospital in that region, from the HASS EDIS database that was in use for ED clinical information throughout the hospitals in that region in 2007; this year was chosen as it was the last year in which consistent data was collected in ED and able to be extracted. The data analyst had been working extensively on the HASS EDIS dataset with the data entry clerks to ensure completeness of clinical information. A standardized data extraction form was used to extract data on the number of paediatric presentations to ED and the number of injury admissions to the paediatric ward. For paediatric ED admissions and injuries, we identified several ICD-10-AM clinical codes that may have been used for physical abuse and/or neglect. Codes included a child at risk, child abuse/non-accidental injury, physical abuse/assault, neglect/abandonment, and accidental ingestion/poisoning: these were identified following discussion with data entry clerks in ED and the Clinical Information Department.

We carried out in-depth semi-structured interviews with senior clinicians, *i.e.*, doctors, nurses and social workers from EDs, paediatric wards and social work departments (as relevant) from each hospital that assesses children in the region. Participants were purposefully chosen; heads of the

relevant departments were informed of the quality improvement project by email and were requested to nominate the most suitable clinicians for the in-depth interview. Questions covered estimates of numbers of suspected PAN cases seen, referral and assessment protocols and pathways, follow-up mechanisms, barriers and enablers to appropriate assessment and care. Interview schedules were pilot tested in two sites and subsequently modified. Interviews were conducted face to face by a doctor and a social worker from the project team. No clinician declined to participate; some had to reschedule their interviews due to other commitments. Each interview lasted between one and one and a half hours; all interviews with clinicians were conducted between August and December 2009.

Telephone interviews were carried out with the managers of the relevant statutory child protection authority, the departments of Family and Community Services (CS), in the early part of 2010. The managers of 12 local departments were provided information by email about the project and asked to nominate the most appropriate respondent; many were already aware of it via inter-agency meetings. Questions explored pathways and protocols used (if any) by caseworkers in arranging medical assessments for children with suspected PAN, barriers encountered, and suggestions for improvement. Representatives from one CS agency could not be interviewed despite numerous attempts. Transcription occurred as soon as possible after the interviews.

Analysis

Data from the Clinical Information Department on ED presentations was entered into an Excel spreadsheet and simple descriptive analysis of the data was carried out. We analysed the information from interviews using thematic content analysis [21], specifically searching across the content of interviews of clinicians and child protection workers to find repeated patterns of meaning. Paediatric presentations for suspected abuse and or neglect were compared to total paediatric presentations to ED and paediatric wards in 2007 and correlated with clinician estimates of PAN presentations, thus triangulating data analysis.

A multi-site ethics approval was obtained *via* the lead Human Research Ethics Committee at Royal Prince Alfred Hospital.

3. Results

In 2007, there were 64,700 paediatric (children under 16 years) presentations to EDs across hospitals in the region out of a total of 323,949 presentations (20%); 15,573 (24%) of paediatric presentations were for injury. Table 1 lists the available data on children presenting to hospital sites with suspected PAN in 2007, hospitals are listed A–I in order of paediatric admissions, A being the busiest. Hospital A had the highest number of injuries presenting to ED, 125 with CM concerns, 4% of injury presentations and 1% of all ED presentations. Hospital B had 118 paediatric injury presentations with CM concerns, 5% of injury presentations and 1% of all paediatric ED presentations followed by Hospital C and Hospital D with 3% of injury presentations having identified CM concerns. All other hospital data had concerning injuries listed as 2% of paediatric injuries. In all hospitals except for Hospital E, paediatric injuries with CM concerns were approximately 1% of ED presentations.

Table 1. Correlation of paediatric injury presentations with clinician estimates of child maltreatment.

Facility ¹	Total paediatric ED attendance	Injury presentations n (%) **	Injury admissions n (%) **	ED Injury with CM concerns n (%) **	Clinician estimate of PAN	Audit of Paediatric ED presentations
A	12,989	3012 (23)	202 (2)	125 (1)	8–12/ month	Yes
B	11,477	2538 (22)	389 (3)	118 (1)	30/year to 30/month	No
C	8112	1926 (24)	117 (1)	65 (1)	24–52/year	No
D	7850	1892 (24)	109 (1)	56 (1)	10–50/year	No
E	7431	993 (13)	51 (1)	19 (0)	60–70/year	Yes
F	6957	1521(22)	85 (1)	37 (1)	12–50/year	No
G	4141	1528 (37)	1 *	27 (1)	6–24/year	Yes
H	4052	1373 (34)	77 (2)	32 (1)	4–12/year	No
I	1691	790 (47)	12 (1)	18 (1)	Minimal	Yes

Notes: ¹ Facilities A–I listed according to number of paediatric admissions, greatest to least. A, B, C, D, E, F, H are district-level paediatric services, Hospitals B, D and I are tertiary level services; * No in-patient paediatric ward available; ** Percentage presented in whole numbers only for clarity.

There were 36 clinicians across 9 hospitals that were interviewed (13 doctors, 13 nurses and 10 social workers), as well as 12 managers from the relevant statutory child protection agencies, see Table 2. Responses are reported against specific themes and categories below; direct quotes are not provided so as to preserve anonymity of respondents.

Table 2. Respondents to in-depth interviews.

Facility ¹	Medical	Nursing	Social work
A	1 Paediatric, 1 ED	1 ED, 1 Paediatric	1 Paediatric
B	1 Paediatric, 1 ED	1 ED, 1 Paediatric	1 Paediatric
C	1 Paediatric, 1 ED	1 Paediatric	1 Paediatric, 1 ED
D	1 ED	1 ED, 1 Paediatric	1 ED
E	1 Paediatric	1 ED	1 Paediatric
F	2 Paediatric	1 Paediatric	1 paediatric
G	1 ED	1 ED	1 ED
H	1 Paediatric	1 ED, 1 Paediatric	1 Paediatric
I	1 ED	1 ED	1 ED
CS			12

Note: ¹ Facilities A–I listed according to number of paediatric admissions, greatest to least.

3.1. What is the Clinical Burden of Child Physical Abuse/Neglect in This Region?

Clinician estimates of the burden of child PAN presentations ranged from very few per year to many per week (see Table 1). There was considerable variation in the estimated presentations of PAN even within hospitals between disciplines. No clinician or service had any data on CM or PAN presentations; this was felt to be a major drawback of data collection systems. Clinicians reported that the current electronic information system used in ED was not useful for auditing or estimating the numbers of presentations for a range of clinical concerns. Audits of paediatric presentations to ED were carried out by four hospitals in the region (Table 1). Managers from statutory agencies likewise

had no recorded data on the number of medical assessments carried out for child PAN cases; their estimates ranged from three to 24 per year.

3.2. How are Child Physical Abuse/Neglect Assessments Conducted?

Table 3 lists the personnel involved in-hours for PAN assessments in ED. There were differing accounts on the personnel involved, including use of social workers. When clinicians were asked about whether there was a written procedure within their service for children with suspected PAN, of those who said yes (n = 14), six were outdated or could not be located. Three sites used a paediatric injury risk assessment process or protocol for identifying when injuries could be attributed to CM. Table 4 lists the procedures undertaken in hospitals in the region following the clinical assessment.

Table 3. Who conducts child physical abuse/neglect assessments?

Facility ¹	In Hours	Social Worker Involved
A	Paediatric Registrar ² supported by paediatrician	Rarely
B	Paediatric Registrar + paediatric SW * + Community paediatrician	Always
C	Paediatric Registrar or junior doctor ± Paediatrician support	Rarely
D	ED Doctor + Paediatric Registrar with ED Consultant Support ± SW ± RN **	Rarely
E	Paediatric registrar or junior doctor	Always
F	Paediatric registrar supported by paediatrician	Sometimes
G	ED doctor	Never
H	ED doctors or Paediatric junior or Paediatrician	Rarely
I	ED registrar + RN ** + SW * supported by ED Consultant	Rarely

Notes: *Social Worker; ** Registered Nurse; ¹ Facilities A-I listed according to number of paediatric admissions, greatest to least. A, B, C, D, E, F, H are district level paediatric services; ² Registrar: trainee Paediatrician.

Table 4. Procedures followed after child physical abuse/neglect clinical assessment.

Facility ¹	Medical Report	Follow-up (proportion)	Who follows up	CP Policy used
A	Yes	Yes (75%)	Orthopaedic, Ambulatory Paediatrics, Paediatrician	No (Doctors) Yes (nurses)
B	Yes	Yes (100%)	Paediatrician, or child at risk clinic	Yes, not used clinically
C	No	Yes (100%)	Paediatrician, ED clinic	Yes, not used clinically
D	No	Yes (don't know)	Paediatrician, CPU, CS	No
E	No	No	CS	Yes and helpful clinically
F	No	Yes (>50%)	Local paediatricians, CS	Aware, not used clinically
G	No	Yes (if transferred)	All transferred to hospital A	Not aware
H	No	Yes (most)	Paediatrician or GP	Aware of policy not used clinically
I	No	Yes (75%)	Hospital elsewhere	Aware, not used

Notes: ¹ Facilities A–I listed according to number of paediatric admissions, greatest to least. A, B, C, D, E, F, H are district level paediatric services; CP Policy: Child Protection policy; CS: Community Services; CPU: Child Protection Unit (forensic service based in a tertiary Children's Hospital).

3.3. What Child Protection Training Does Your Staff Get?

As a response to the question “what sort of training does your staff get in child protection?”, most (32, 89% of respondents) said that staff within their service had completed the two-hour mandatory training; 26 respondents (71%), said their staff had completed one-day mandatory child protection training. Responses to this question did not vary between the clinical groups. Participants listed a range of other child protection training sessions they had attended; only one respondent (medical) was aware of and had attended a clinically oriented training session.

3.4. What is Working Well?

- *Team approach:* Multidisciplinary teams with social worker involvement often had staff with a “passion” for child advocacy. Particular local teams with good working cultures were identified and commended on their collaborative working relationship.
- *Availability of protocol and policy:* Clinicians, who knew about the existing child protection policy, were able to find it and use it when required. Being able to locate the policy online was particularly useful.
- *Positive working relationship between health and statutory services:* Some teams had established relationships with their local CS, this facilitated ease of reporting CM concerns and improved referral pathways between CS and hospitals.
- *Good communication channels:* These were reported in certain facilities or teams and included internal and external pathways. Teams with a culture of consultation with senior staff were acknowledged. For child protection managers, being able to consult a paediatrician and having a key contact person at each site to facilitate the referral process was a major bonus.

3.5. What are the Gaps in Systems Currently?

- *Inadequate awareness, recognition and follow-up of CM among frontline clinicians:* Social workers were more likely to point out that there was inadequate awareness and recognition of CM in the acute setting. While responses for whether some form of follow-up was provided varied (Table 3), most hospitals had inadequate psychosocial staff, *i.e.*, social workers to provide appropriate follow-up for children identified as at risk.
- *Children with CM concerns not prioritised in EDs:* This was a frustration not just for child protection caseworkers but also for social workers. Caseworkers felt that children should not have to wait for a medical assessment, given their traumatic experiences.
- *Poor communication between hospitals and CS:* Busy clinicians, particularly doctors and nurses, pointed to poor information provided to clinicians by caseworkers, lack of feedback, and case coordination provided by CS.
- *Workforce issues:* Lack of trained and qualified staff was a significant issue, particularly social workers in some hospitals and medical staff with paediatric experience. Workforce constraints contributed to the lack of multi-disciplinary assessments carried out. Limited after-hours availability of access to social work, radiology and paediatric expertise was a concern in the smaller district hospitals.

- *Marked variability in quality*: This was highlighted not just by child protection managers but also by clinicians. There were variations across hospital sites of quality of PAN assessments, timeliness and quality of medical reports.

4. Discussion

This clinical practice improvement project in metropolitan Sydney was carried out to inform planning and coordinate frontline clinical services to adequately respond to CM. Our study shows that children make up a sizable proportion of emergency presentations in metropolitan Sydney; a quarter of all presentations are for injury and a significant minority is attributable to CM. Clearly, the acute hospital setting is one where maltreated children do present to; data from the United States has shown that 10% of all children presenting to an ED are victims of CM and, without identification, a third will be injured again and 5% will die from subsequent injuries [22]. In general, however, there is low-quality evidence on the accuracy of instruments for identifying abused children in the acute setting [13,23]. Beyond merely attempting to quantify the clinical burden of child PAN presenting to acute services, we also identified positive and negative interagency working practices and developed minimum clinical standards for assessment and care of this cohort of children in this region (see Box 1) [24]; from the results of this project and guided by the available international evidence.

Box 1. Minimum standards for the clinical assessment of children presenting with suspected physical abuse and/or neglect to frontline services.

-
- All paediatric injuries/poisoning presenting to ED are triaged using Paediatric Injury Sticker or equivalent¹
 - All children presenting with suspected significant PA/N or referred by CS, are assessed by a paediatric trained doctor, social worker, ± nurse as appropriate
 - All clinical assessments to follow PA/N clinical protocol²
 - Assessments to be discussed with most senior Consultant
 - If child protection report is to be generated, it needs to be counter-signed by Consultant
 - Child Protection Medical Report to follow standard format³
 - Clinical photography if needed to be organised via the hospital audio-visual service
 - PA/N protocol and report to be filed in the medical record
 - Clearly defined pathway in existence between child protection services and frontline health services in the region for children presenting with PA/N
 - Paediatric and psychosocial follow-up to be available to all children identified with abuse and neglect, across the region
 - All frontline clinical staff (*i.e.*, doctors, nurses and social workers) working in ED and Paediatric Departments have completed core child protection training
 - Clinically oriented child protection training to be scheduled annually in continuing education programs in all ED and Paediatric Departments across the region
-

Notes: ¹ The existing paediatric injury/poisoning risk assessment sticker has been incorporated into an online risk assessment tool in ED; ² The Suspected Child Abuse and Neglect (SCAN) clinical protocol is available on the intranet across the region; ³ A template for the Child Protection Medical Report is available on the intranet across the region; ED: Emergency Department; PA/N: physical abuse and/or neglect; CS: Community Services, the State child protection service.

The obvious presence of children and families in our acute frontline services notwithstanding, the real burden of PAN presentations is still unclear. In 2007–2008, there were over 34,000 substantiated child protection reports made to the Child Protection Helpline in NSW; one-fifth of these reports were for physical abuse [25]. In our study, data from paediatric ED presentations coded with CM-type concerns in 2007 ranged from 20 per year in one facility (with low paediatric presentations) to 125 in the facility with the largest paediatric population. Clinician and child protection managers' estimates of PAN presentations to frontline services varied widely from four per year to one a day. From the available quantitative data on paediatric injury presentations, PAN-type concerns account for approximately 3%–5% of injury presentations and 1% of all paediatric ED presentations in our study. Early detection rates of child abuse in EDs vary widely among different countries (Netherlands: 0.2%, Italy 2%, the United Kingdom: 4%–6.4%, United States: 10%) due to varied screening tools, different settings and access to health services [9,14,26–29]. While our study suggests that in metropolitan Sydney, in busy district hospitals, physical abuse/neglect accounts for at least 1% of ED presentations; this is likely to be an underestimate and perhaps not the right question.

This study showed that there was wide variation in response to children presenting with suspected PAN presentations to frontline services. There is variation in who assesses them, whether protocols are used, follow-up offered and medical reports done. Some of this reflects the resourcing of each facility in terms of trained paediatric staff, some of this reflects variation in clinical practice. Comprehensive guidelines do exist for clinicians responding to children with suspected maltreatment [30,31]. We know that a medical examination is an important component in the assessment of child abuse as it provides information to support or refute an allegation and helps to identify the health and welfare needs of vulnerable children [32]. The significant variation in paediatric and psychosocial follow-up offered to children with suspected maltreatment is of concern, given the high risk of recurrence of maltreatment, especially within the first month of the index event [33]. Clinician interviews matched well with the experiences of child protection managers, who also reported a great variability in the quality of assessments, timeliness of assessments and quality of reports. Only four facilities routinely audited paediatric presentations to ED; these included the busiest and the least busy ED with respect to paediatric presentations. We therefore identified critical problems not just in medical assessments of CM in the acute setting but also inter-agency responses. Much of the work done on inter-agency responses to CM have focused on improving professionals' abilities in information sharing and reporting of concerns [18,34]. Impressive work has also been done in the United Kingdom to standardize peer review processes for paediatricians as an essential component of the medical evaluation of CM [35]. The authors of these peer review standards acknowledged however that there was a role for making peer-review meetings both multidisciplinary and multi-agency [35].

Within the last two decades, there have been many attempts to improve clinicians' performance in EDs with respect to CM [14,15], including adapting guidelines from other national systems [29]. In this metropolitan region, Ziegler *et al.*'s review of children presenting with fractures in Hospital A, found poor identification of CM, poor documentation and follow-up of patients [11]. As a result of this review, the hospital ED put in place a paediatric injury-screening tool, subsequently adopted by two other hospitals. Two of the busiest hospitals use this screening tool and have higher proportions of children with injuries identified as being due to CM (4%–5%), thereby suggesting the tool improves risk identification. Leventhal *et al.*'s study of fractures in young children in the US does suggest that

there has been a significant reduction in the proportion of abusive fractures from the 1980s to the 2000s, due to early recognition of less serious forms of CM and availability of family intervention [36]. A recent paediatric injury study from Queensland, Australia, using linked hospital and child protection service records, found a high proportion of children with unintentional injury codes had CM concerns, thus suggesting that hospital clinicians needed targeted training to ensure children at risk were being detected by the child protection system [37].

According to our respondents, most clinicians within their teams had completed their mandatory child protection training. In a previous study we conducted in this region on knowledge and practice of doctors and nurses, we found that although most clinicians reported some child protection training, more than 70% of ED nurses felt their training was inadequate, compared with 19% of ED doctors [38]. Studies have shown that child protection training improves the ability of clinicians to report suspected CM [39], whereas clinical experiences and training in CM improve the preparedness of doctors to identify and evaluate patients for abuse [40,41]. A systematic review of child protection training and interventions found evidence to support the use of procedural changes that improve documentation of suspected CM but an absence of rigorous evaluation of training programs and their impact [42]. We would suggest that mandatory training in child protection, such as is currently available, is not sufficient on its own to provide a quality response to children presenting with suspected abuse or neglect to frontline services.

In our study, several respondents were able to highlight good examples of local clinical practice, which involved good teamwork and good relationships with on the ground agencies. Health workers and child protection workers identified several gaps in practice and within their organisations and systems. The practice gaps identified were threefold, that is: inadequate awareness and recognition of physical abuse/neglect among frontline health staff; variations in assessments undertaken; and variation in use of procedures and protocols. A systematic review of effectiveness of professional and organizational interventions aimed at improving medical processes, such as documentation or clinical assessments by ED healthcare providers, found that moderate-quality observational studies suggested that education and reminder systems increase clinical knowledge and documentation but these findings were not supported by a multisite randomized trial [43]. System problems included a lack of priority given to suspected CM cases; different staffing arrangements across sites; ineffective data systems to capture PAN presentations to health services; inadequate follow-up systems for identified CM cases; unsatisfactory communication within and between agencies.

5. Conclusions

Tony Morrison promotes the idea of a “strategic leadership of complex practice”; *i.e.*, collective forms of knowing and reflecting that learn from frontline staff accessing practice narratives as well as performance numbers, to achieve a systemic analysis of the state of practice and how it can be improved [44]. We believe that we have tried to do just that—arrive at an in-depth understanding of the pointy end of the complex inter-disciplinary practice involved with responding to child maltreatment within frontline clinical services. We described the clinical burden of child PAN presenting to frontline services in metropolitan Sydney, providing the best available estimate of numbers of children presenting with suspected abuse/neglect. We described professional practice with respect to CM across agency and professional boundaries, as it currently stands. We highlighted

isolated examples of good practice but also pointed out areas for improvement. A twofold challenge exists: to improve service quality within the health system, and to enhance coordination across health and welfare agencies. Based on the findings and international guidelines, we formulated minimum standards for the clinical assessment and care of child PAN in our own region [24], which are currently feasible given the right leadership and organisational support. A vulnerable child and youth population is dependent upon these recommendations being addressed adequately.

Acknowledgements

We gratefully acknowledge the time and enthusiastic support provided by all the clinicians and statutory child welfare workers who were interviewed for this project.

Author Contributions

All authors contributed to the conceptualization of this quality improvement project. Shanti Raman, Michelle Maiese, Katrina Hurley were involved carrying out fieldwork, data entry and analysis. Shanti Raman and David Greenfield were principally involved with writing up the manuscript.

Abbreviations

PAN: physical abuse and/or neglect;

ED: Emergency department;

CM: child maltreatment.

Conflicts of Interest

The authors declare no conflict of interest.

References

1. Gilbert, Ruth, Cathy Spatz Widom, Kevin Browne, David Fergusson, Elspeth Webb, and Staffan Janson. "Burden and Consequences of Child Maltreatment in High-Income Countries." *The Lancet* 373 (2009): 68–81.
2. Fang, Xiangming, Derek S. Brown, Curtis S. Florence, and James A. Mercy. "The Economic Burden of Child Maltreatment in the United States and Implications for Prevention." *Child Abuse & Neglect* 36 (2012): 156–65.
3. Cuijpers, Pim, Filip Smit, Froukje Unger, Yvonne Stikkelbroek, Margreet ten Have, and Ron de Graaf. "The Disease Burden of Childhood Adversities in Adults: A Population-Based Study." *Child Abuse & Neglect* 35 (2011): 937–45.
4. Wood, James. *Report of the Special Commission of Inquiry into Child Protection Services in NSW*. Sydney: State of NSW through the Special Commission of Inquiry into Child Protection Services in NSW, 2008.
5. Department of Premier and Cabinet. *Keep Them Safe: A Shared Approach to Child Wellbeing 2009–2014*. Sydney: Department of Premier and Cabinet, NSW Government, 2009.

6. Felitti, Vincent J., Robert F. Anda, Dale Nordenberg, David F. Williamson, Alison M. Spitz, Valerie Edwards, Mary P. Koss, and James S. Marks. "Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (Ace) Study." *American Journal of Preventive Medicine* 14 (1998): 245–58.
7. Flaherty, Emalee G., Richard Thompson, Alan J. Litrownik, Adrea Theodore, Diana J. English, Maureen M. Black, Traci Wike, Lakecia Whipper, Desmond K. Runyan, and Howard Dubowitz. "Effect of Early Childhood Adversity on Child Health." *Archives of Pediatrics and Adolescent Medicine* 160 (2006): 1232–38.
8. Scott, Debbie, Lil Tonmyr, Jenny Fraser, Sue Walker, and Kirsten McKenzie. "The Utility and Challenges of Using Icd Codes in Child Maltreatment Research: A Review of Existing Literature." *Child Abuse & Neglect* 33 (2009): 791–808.
9. Chang, David C., Vinita Knight, Susan Ziegfeld, Adil Haider, Dawn Warfield, and Charles Paidas. "The Tip of the Iceberg for Child Abuse: The Critical Roles of the Pediatric Trauma Service and Its Registry." *Journal of Trauma* 57 (2004): 1189–98.
10. King, Wendalyn K., Eric L. Kiesel, and Harold K. Simon. "Child Abuse Fatalities: Are We Missing Opportunities for Intervention?" *Pediatric Emergency Care* 22 (2006): 211–14.
11. Ziegler, David S., John Sammut, and Anne C. Piper. "Assessment and Follow-up of Suspected Child Abuse in Preschool Children with Fractures Seen in a General Hospital Emergency Department." *Journal of Paediatrics and Child Health* 41 (2005): 251–55.
12. Gilbert, Ruth, John Fluke, Melissa O'Donnell, Arturo Gonzalez-Izquierdo, Marni Brownell, Pauline Gulliver, Staffan Janson, and Peter Sidebotham. "Child Maltreatment: Variation in Trends and Policies in Six Developed Countries." *The Lancet* 379 (2011): 758–72.
13. Louwers, Eveline C. F. M., Maria J. Affourtit, Henriette A. Moll, Harry J. de Koning, and Ida J. Korfage. "Screening for Child Abuse at Emergency Departments: A Systematic Review." *Archives of Disease in Childhood* 95 (2009): 214–18.
14. Benger, Jonathan R., and Alison V. Pearce. "Quality Improvement Report: Simple Intervention to Improve Detection of Child Abuse in Emergency Departments." *British Medical Journal* 324 (2002): 780–82.
15. Smeekens, A. E. F. N., D. M. Broekhuijsen-van Henten, Judith S. Sittig, I. M. B. Russel, O. Th J. ten Cate, N. M. Turner, and Elise M. van de Putte. "Successful E-Learning Programme on the Detection of Child Abuse in Emergency Departments: A Randomised Controlled Trial." *Archives of Disease in Childhood* 96 (2011): 330–34.
16. Woodman, Jenny, Fiona Lecky, Deborah Hodes, Marion Pitt, Brent Taylor, and Ruth Gilbert. "Screening Injured Children for Physical Abuse or Neglect in Emergency Departments: A Systematic Review." *Child: Care, Health and Development* 36 (2009): 153–64.
17. Louwers, Eveline, Ida Korfage, Marjo Affourtit, Harry de Koning, and Henriette Moll. "Facilitators and Barriers to Screening for Child Abuse in the Emergency Department." *BMC Pediatrics* 12 (2012): 167.
18. Bunting, Lisa, Anne Lazenbatt, and Isla Wallace. "Information Sharing and Reporting Systems in the UK and Ireland: Professional Barriers to Reporting Child Maltreatment Concerns." *Child Abuse Review* 19 (2010): 187–202.

19. Morgan, Katie, John Eastwood, and Shola Faniran. *Headline Population Indicators Data Report 2009: A Report for the South West Sydney Region on Key Statistics Relating to the Health and Wellbeing of Its Children and Families*. Liverpool, Australia: Karitane and the Department of Community Paediatrics, Sydney South West Area Health Service, 2010.
20. Greene, Jennifer C., Valerie J. Caracelli, and Wendy F. Graham. "Toward a Conceptual Framework for Mixed-Method Evaluation Designs." *Educational Evaluation and Policy Analysis* 11 (1989): 255–74.
21. Braun, Virginia, and Victoria Clarke. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3 (2006): 77–101.
22. Mace, Sharon E., Michael J. Gerardi, Ann M. Dietrich, Stephen R. Knazik, Deborah Mulligan-Smith, Robert L. Sweeney, and Craig R. Warden. "Injury Prevention and Control in Children." *Annals of Emergency Medicine* 38 (2001): 405–14.
23. Bailhache, Marion, Valeriane Leroy, Pascal Pillet, and Louis-Rachid Salmi. "Is Early Detection of Abused Children Possible?: A Systematic Review of the Diagnostic Accuracy of the Identification of Abused Children." *BMC Pediatrics* 13 (2013): 202.
24. Raman, Shanti, Michelle Maiese, and Katrina Hurley. *Assessment and Care for Children Presenting with Suspected Physical Abuse and/or Neglect to Acute Services across Sydney South West Area Health Service: Clinical Practice Improvement Project*. Sydney: Sydney South West Area Health Service, 2012.
25. Bromfield, Leah, and Briony Horsfall. *Child Abuse and Neglect Statistics*. Melbourne: Australian Institute of Family Studies, 2010.
26. Louwers, Eveline C. F. M., Ida J. Korfage, Marjo J. Affourtit, Dop J. H. Scheewe, Marjolijn H. van de Merwe, Françoise A. F. S. R. Vooijs-Moulaert, Claire M. C. Woltering, Mieke H. T. M. Jongejan, Madelon Ruige, Henriëtte A. Moll, and *et al.* "Detection of Child Abuse in Emergency Departments: A Multi-Centre Study." *Archives of Disease in Childhood* (2011): 422–25.
27. Palazzi, S., G. de Girolamo, and T. Liverani. "Observational Study of Suspected Maltreatment in Italian Paediatric Emergency Departments." *Archives of Disease in Childhood* 90 (2005): 406–10.
28. González-Izquierdo, Arturo, Jenny Woodman, Lynn Copley, Jan van der Meulen, Marian Brandon, Deborah Hodes, Fiona Lecky, and Ruth Gilbert. "Variation in Recording of Child Maltreatment in Administrative Records of Hospital Admissions for Injury in England, 1997–2009." *Archives of Disease in Childhood* 95 (2010): 918–25.
29. Sittig, Judith S., Erica D. M. Post, Ingrid M. B. Russel, Ingrid A. G. van Dijk, Edward E. S. Nieuwenhuis, and Elise M. van de Putte. "Evaluation of Suspected Child Abuse at the ED; Implementation of American Academy of Pediatrics Guidelines in the Netherlands." *The American Journal of Emergency Medicine* 32 (2013): 64–66.
30. National Collaborating Centre for Women's and Children's Health. *When to Suspect Child Maltreatment*. London: National Institute for Health and Clinical Excellence, 2009.
31. Royal College of Paediatrics and Child Health (RCPCH). *Child Protection Companion*. London: RCPCH, 2006.
32. Kirk, Charlotte B., Angela Lucas-Herald, and Jacqueline Mok. "Child Protection Medical Assessments: Why do We Do Them?" *Archives of Disease in Childhood* 95 (2010): 336–40.

33. Hindley, Nick, Paul Ramchandani, and David P. H. Jones. "Risk Factors for Recurrence of Maltreatment: A Systematic Review." *Archives of Disease in Childhood* 91 (2006): 744–52.
34. Goad, John. "Understanding Roles and Improving Reporting and Response Relationships across Professional Boundaries." *Pediatrics* 122 (2008): S6–9.
35. Thomas, Amanda, and Alison Mott. "Child Protection Peer Review for Paediatricians." *Child Abuse Review* 22 (2013): 60–66.
36. Leventhal, John M., Ilse A. Larson, Denise Abdo, Sujatha Singaracharlu, Carolina Takizawa, Cindy Miller, Rob Goodman, Dana Schwartzc, Susanne Grassoc, and Katherine Ellingsond. "Are Abusive Fractures in Young Children Becoming Less Common?: Changes over 24 Years." *Child Abuse & Neglect* 31 (2007): 311–22.
37. McKenzie, Kirsten, Debbie Scott, Jennifer A. Fraser, and Michael P. Dunne. "Assessing the Concordance of Health and Child Protection Data for 'Maltreated' and 'Unintentionally Injured' Children." *Injury Prevention* 18 (2012): 50–57.
38. Raman, Shanti, Anna Holdgate, and Rebecca Torrens. "Are Our Frontline Clinicians Equipped with the Ability and Confidence to Address Child Abuse and Neglect?" *Child Abuse Review* 21 (2012): 114–30.
39. Lawrence, Linda L., and Stephen J. Brannen. "The Impact of Physician Training on Child Maltreatment Reporting: A Multi-Specialty Study." *Military Medicine* 165 (2000): 607–11.
40. Narayan, Aditee Pradhan, Rebecca R. S. Socolar, and Karen St. Claire. "Pediatric Residency Training in Child Abuse and Neglect in the United States." *Pediatrics* 117 (2006): 2215–21.
41. Starling, Suzanne P., Kurt W. Heisler, James F. Paulson, and Eren Youmans. "Child Abuse Training and Knowledge: A National Survey of Emergency Medicine, Family Medicine, and Pediatric Residents and Program Directors." *Pediatrics* 123 (2009): e595–602.
42. Carter, Yvonne H., Michael J. Bannon, Caroline Limbert, Andrea Docherty, and Jane Barlow. "Improving Child Protection: A Systematic Review of Training and Procedural Interventions." *Archives of Disease in Childhood* 91 (2006): 740–43.
43. Newton, Amanda S., Belle Zou, Michele P. Hamm, Janet Curran, Sahil Gupta, Celeste Dumonceaux, and Melanie Lewis. "Improving Child Protection in the Emergency Department: A Systematic Review of Professional Interventions for Health Care Providers." *Academic Emergency Medicine* 17 (2010): 117–25.
44. Morrison, Tony. "The Strategic Leadership of Complex Practice: Opportunities and Challenges." *Child Abuse Review* 19 (2010): 312–29.