

Covert Video Recordings of Life-threatening Child Abuse: Lessons for Child Protection

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ABSTRACT. *Objective.* To describe historic markers and clinical observations of life-threatening child abuse as diagnosed using covert video surveillance (CVS).

Design. A descriptive, retrospective, partially controlled case study.

Setting. Two hospitals (in London and North Staffordshire, UK) receiving referrals for the investigation of apparent life-threatening events (ALTE), with the availability of CVS.

Patients. A total of 39 children (age range at CVS, 2 to 44 months; median, 9 months) in whom hospital CVS was used to investigate suspicions of induced illness. Thirty-six were referred for investigation of ALTE, one with suspected epilepsy, one with failure to thrive, and one with suspected strangulation. A control group consisted of 46 children with recurrent ALTE proven on physiologic recordings to be attributable to a natural medical cause (9 attributable to epileptic seizures, and 37 attributable to respiratory problems).

Intervention. Collection of historic details from medical, social service, and police records; interagency collaboration in planning, investigations, and management; development and use of CVS as a clinical tool in the

investigation of patients in whom there was suspicion of induced illness.

Outcome. Confirmation of attempted suffocation or other child abuse from CVS.

Results. CVS revealed abuse in 33 of 39 suspected cases, with documentation of intentional suffocation observed in 30 patients. Poisonings (with disinfectant or anticonvulsant), a deliberate fracture, and other emotional and physical abuse were also identified under surveillance. The first ALTE occurred at a median age corrected for the expected date of delivery of 3.6 months in the CVS patients and of 0.3 months in controls. Three CVS patients and 27 of the control children (including 20 at <32 weeks' gestation) were born prematurely. Bleeding from the nose and/or mouth was reported in 11 of the 38 patients with ALTE undergoing CVS but in none of the 46 controls. Four patients who had been subjected to recurrent suffocation before CVS had permanent neurologic deficits and/or required anticonvulsant therapy for epileptic seizures resulting from hypoxic cerebral injury.

The 39 patients undergoing CVS had 41 siblings, 12 of whom had previously died suddenly and unexpectedly. Eleven of the deaths had been classified as sudden infant death syndrome but after CVS, four parents admitted to suffocating eight of these siblings. One additional sibling who had died suddenly with rotavirus gastroenteritis was reinvestigated after CVS of her sister revealed poisoning, and death was found to be caused by deliberate salt poisoning. Other signs of abuse were documented in the medical, social, and police records of an additional 15 of the siblings. In the 52 siblings of the 46 controls, 2 had died: one from hypoplastic left heart at 5 days and the other suddenly and unexpectedly (classified as sudden infant death syndrome) at 7 weeks.

Twenty-three of the abusive parents were diagnosed by a psychiatrist as having personality disorders.

Conclusions. Induced illness is a severe form of abuse that may cause death or permanent neurologic impairment. It may be accompanied by other severe forms of abuse, may result in behavioral disorders, and may be accompanied by immeasurable suffering. Detection of this abuse requires careful history-taking; thorough examination of the health, social, and police

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records; and close and focused collaboration between hospital and community child health professionals, child psychiatrists, social workers, and police officers. CVS may help investigate suspicions and ensure that children are protected from additional abuse. When parents have failed to acknowledge that they have deceived health professionals, partnership with them in seeking to protect their children may be neither safe nor effective. *Pediatrics* 1997;100:735-760; *child abuse, sudden infant death syndrome (SIDS), apparent life-threatening events (ALTE), apnea of infancy, suffocation, poisoning, Munchausen syndrome by proxy.*

ABBREVIATIONS. CVS, covert video surveillance; ALTE, apparent life-threatening events; CPR, cardiopulmonary resuscitation; REC, Research Ethics Committee; SIDS, sudden infant death syndrome; EDD, expected date of delivery; MSBP, Munchausen syndrome by proxy; EEG, electroencephalogram.

Since the landmark publications of Kempe¹ and Adelson² in the early 1960s, accounts of long-standing and sometimes fatal abuse continue to appear.^{3,4} A recent report of the National Commission of Inquiry into the Prevention of Child Abuse revealed that Britain is failing to protect many of its children.^{5,6} Similar situations prevail in most English speaking countries, including the United States, with varying levels of support and protection given to the children identified.⁷ In developing countries, there are minimal resources, legislation, and procedures for child protection.⁸ The true extent of child abuse remains uncertain, and there is ongoing debate regarding the structure of social and health care systems that will best detect and manage this complex problem.

The circumstances associated with child mistreatment may range from a sudden isolated loss of control by a parent to circumstances in which there is a long-standing catalog of premeditated and intentional acts to harm the child. In the former situation, there may be multiple cumulative personal, family, and environmental pressures conspiring to push individuals beyond thresholds of restraint. The latter form of abuse, however, may involve injuries such as multiple fractures of different ages, deliberate burns or scalds, pinch or human bite marks, and the induction of illness in the child. Such injuries indicate the seriously disordered psychological relationship between the child and caregiver.

During the past 10 years, we have developed the use of covert video surveillance (CVS)⁹⁻¹¹ and documented the persistent and perverse nature of this life-threatening abuse as it occurs in infants and young children presenting with one particular symptom, namely recurrent apneic or cyanotic episodes, often called apparent life-threatening events (ALTE).¹² We present information here on the clinical features, the accompanying abuse seen during CVS, the psychopathology of the parents, and the extent of abuse in siblings.

Our management of this abuse, in close collaboration with social services professionals and the police child protection team, emphasizes the importance of a multiagency collaborative approach to child protection as recommended under the Children Act (1989).¹³ It also advocates for new approaches to

identify abuse in situations in which it is not possible to trust or work in partnership with parents.

METHODS

Patients and Controls

Between June 1986 and December 1994, 39 patients underwent CVS (36 after ALTE, 1 for investigation of suspected strangulation, 1 for fabricated epilepsy, and 1 for severe failure to thrive and suspicion of poisoning). The number of ALTE reported by parents before CVS ranged from 2 to more than 50 (median, 7). In 29 patients, cardiopulmonary resuscitation (CPR) involving mouth-to-mouth breathing or external cardiac massage was reported by parents and/or performed by health professionals.

Of the 39 patients, 37 were referred from outside the local district (from 32 different hospitals) to national centers at the Royal Brompton and North Staffordshire hospitals. Two were patients from within the North Staffordshire Health District, which has a population of 465 000, with 6500 births each year. A total of 252 patients presenting with ALTE that required CPR were referred to our department at these two hospitals during the 8-year period. As we developed CVS, there was almost certainly a bias toward referrals of patients with ALTE and suspicions of abuse. Therefore, these figures cannot provide a true epidemiologic indication of the frequency of intentional suffocation as a mechanism for ALTE.

Hospital medical records of patients undergoing CVS and their siblings were examined for demographic details, presenting features, and relevant family and social histories (see Tables 1-5). Records from child protection case conferences and planning meetings, including input from the social workers, police, and health professionals, and psychiatric reports on family members (when permitted) were also examined on all patients undergoing CVS. Details of the parents who had abused the first 14 patients undergoing CVS were reviewed by a child psychiatrist who provided a more complete psychological profile.¹⁰

Data on the 38 children and their families who presented with ALTE and underwent CVS were compared with those on all 46 children referred to our unit during the same time period who had 1) also suffered recurrent ALTE and received CPR,¹⁴ and 2) undergone a physiologic recording that confirmed during a subsequent event that their ALTE was attributable to a natural cause.

Information about the control children was obtained from their hospital medical records, but we were unable to investigate further the psychosocial and medical backgrounds of their parents or other family members.

In 37 cases, CVS was authorized after a multiagency planning meeting (organized and chaired by social services professionals, who have statutory responsibility for child protection in the United Kingdom) had agreed that it was the only mean through which abuse could be confirmed or refuted and long-term protection ensured. In one patient, CVS was implemented after telephone agreement among agencies because of the perceived immediate threat to the child. One case was initiated in Australia after close discussion with one of the authors (Dr Southall).

Methods of Covert Surveillance

A full account of the technique used in North Staffordshire Hospital since July 1992 has been published.¹⁵ In brief, the child was nursed in a cubicle and cared for by his/her parent(s) while observation took place from a nearby office.

Parents were informed that their child would undergo multichannel physiologic recordings until an event occurred and the resulting data could be analyzed. Of course, parents were not told about the hidden cameras or microphone. They were encouraged to care for their child as if at home. They could have the child on their lap or walk around the bed. The lead attaching the child to the recording system was 1.5 meters long, prohibiting the child from being taken into the bathroom in the cubicle, out of range of the cameras. When the parent needed a break (for example, to have a meal in the canteen), nursing staff would take over the child's care.

On moving our program to Staffordshire, we presented the interagency protocol established with the child protection team in London, including the Metropolitan Police, to the local child protection team. Staffordshire police expressed that they were unable

to carry out the surveillance; however, they confirmed that using nursing staff as observers would not be illegal. As long as collected carefully, using methods similar to those used by the Metropolitan Police, evidence would be admissible. Our concern, however, was not criminal issues, but protection of the child. We considered the surveillance aspect of our work to be police activity. At the Royal Brompton Hospital, we had included a registered mental health nurse as part of the surveillance team to support police officers during the stress of surveillance and to observe the parents and ensure that they were not developing any dangerous behavior that warranted immediate intervention. We considered that this methodology was the best for all involved; unfortunately, however, Staffordshire police could not agree. Unless we provided trained nursing observers, CVS could not continue. We discussed with our nursing staff the ethical implications, and it was agreed that although second-best, they should be trained to carry out CVS. We informed the observer nurses of our publications and showed them examples of video-recorded abuse. They were given every opportunity to withdraw.

The observers were shown how to access the ward and, in particular, the cubicle where the surveillance was being implemented. They had immediate electronic communication with a designated senior pediatrics nurse who cared for the child on the ward. This nurse was able to respond immediately to a paging call from the observers. The pager indicated both low and high priority. A low-priority call indicated that the nurse on the ward should contact the observers by telephone. This enabled the exchange of information, such as a parent who might have turned off a monitor. A high-priority call ensured that the ward nurse attended the patient immediately if, for example, an episode of abuse was observed. If the ward nurse did not respond to the high-priority call within 10 seconds, observers would immediately enter the patient's cubicle. It was known from previous experience that hypoxaemia of sufficient severity to cause electroencephalographic signs of cerebral hypoxia during ALTE attributable to suffocation did not begin until between 60 and 70 seconds after the onset of the obstruction.⁹ For this reason, we considered that a maximum delay of 25 seconds from the onset of the airway obstruction could be permitted before any act of suffocation was interrupted by the observing staff. This delay helped ensure that the video evidence was adequate for legal purposes, but did not risk the occurrence of cerebral hypoxia. There were always two observers scanning two audiovisual screens and tape recorders (one as a back-up in case of failure). All ward staff were informed that CVS was being implemented.

There were four surveillance cameras in the cubicle, one in each corner of the ceiling, thereby providing a complete view. The cameras functioned at low light intensity and produced black and white pictures. There was also a microphone hidden in the ceiling of the cubicle. The observers could look at all four quadrants simultaneously or focus on any one, depending on the movement and position of the patient in the room. As a matter of principle, the observers were asked to observe only the child and not the parents unless they were interacting with the child.

The patient underwent continuous monitoring and recording of transcutaneous P_{O_2} (Kontron 820, Watford, UK), oxygen saturation and pulse waveforms from a pulse oximeter (Nellcor N200, Hayward, CA), breathing movements from a volume expansion capsule (Graseby, Watford, UK) placed on the abdomen, and electrocardiography from three electrodes on the chest wall. The transcutaneous monitor (electrode temperature 43°C, normal values, 50 to 70 mm Hg in air) was the only active alarm and was set at 20 mm Hg, which would detect any potentially life-threatening hypoxemia.¹⁶ The presence of this alarm provided additional security for events that might occur in the patient, whether attributable to natural causes or abuse.

Parents were asked to notify nursing staff on the ward immediately, using an emergency alarm button, should their child suffer an apneic/cyanotic episode or show any other sign of distress.

The mother of patient 24, in whom there had been previous evidence on physiologic recording to suggest intentional suffocation, was seen to break her infant's arm. This was an unexpected form of abuse and thereafter, the guidelines for observers were modified for earlier intervention if the parents' behavior indicated imminent abuse involving physical violence of this type.

After the identification of an abusive incident, the nurse would remain in the cubicle with the patient until a police officer arrived.

Local police knew that CVS was being implemented and responded rapidly when requested.

After surveillance, debriefing was arranged for nursing and medical staff. Social workers and the police child protection team were also invited. The case was discussed for solutions to future problems. Ward nurses and observers were offered individual counseling.

Ethical and Medicolegal Issues

Research into the development of CVS was approved by the Research Ethics Committee (REC) of the Royal Brompton Hospital. On moving to North Staffordshire Hospital, we submitted our protocol to the REC there, although we did not consider that after 16 patients had been documented as subjects of life-threatening abuse, this work represented research. The REC in North Staffordshire agreed with us. The use of CVS was also explicitly approved, subject to safeguards contained within an interagency protocol,¹⁵ by the North Staffordshire Area Child Protection Committee and by the UK court system.¹⁷ Under British law in general, there is nothing illegal about a breach of privacy. As occupier of the premises, the North Staffordshire Hospital National Health Service Trust was lawfully entitled to install surveillance equipment. Evidence obtained by CVS was also admissible in the UK courts. The following was stated by a judge in court proceedings involving the use of CVS: "If a doctor considers that covert video surveillance is essential for the treatment of his patient, the doctor would be entitled to undertake this process without parental consent, provided that he is satisfied that there is no risk that the patient will come to any serious harm."¹⁷ Nursing staff who were uncomfortable with CVS were not required to participate. References¹⁸⁻²² include discussions of some of the ethical issues regarding the use of CVS.

RESULTS

Summary of Findings at Surveillance

The median duration of CVS was 29 hours (range, 15 minutes to 15 days; interquartile range, 5.4 to 60 hours).

Cases 1 to 23, 25 to 28, 33 to 35 (n = 30)

CVS revealed intentional suffocation of the child. All index children and their siblings were subject to court orders (Children Act, 1989).¹³ All parents were convicted in a criminal court.

Case 24

In this child, there was a physiologic recording during an ALTE suggestive of suffocation. Subsequently, when the child was 3 months of age, CVS was implemented and the mother observed to break her infant's arm (radius and ulna).²³

Case 29

Three siblings had died from sudden infant death syndrome (SIDS) at ages 4.5, 0.6, and 1.4 months. This fourth child, 5 months of age, presented with recurrent ALTE, but surveillance did not show suffocation. A subsequent court case established that the mother had suffocated and killed her previous three babies.

Case 30

This 20-month-old child was already the subject of an interim care order (that is, awaiting a final decision on long-term care) when surveillance was initiated because of seven fractures of different ages and three episodes of probable strangulation (petechial hemorrhages over the face, neck, and upper chest). The suspected perpetrator was the father. The mother was in the room with the child for much of

the surveillance period and demonstrated a loving and caring interaction. The child was subsequently cared for by the mother alone, and there was no additional evidence of abuse.

Case 31

Surveillance showed the mother fabricating medical histories as well as physically and emotionally abusing her 27-month-old child. Subsequently, the child was subject to a care order.

Case 32

The mother was observed attempting to poison her 43-month-old child with disinfectant and to force a toothbrush down the child's throat. The child's sister had died suddenly at 23 months of age; her death had been attributed to gastroenteritis when rotavirus was found in the postmortem stool specimen. After the findings on CVS, an investigation into her death was conducted, and the mother was convicted of cruelty to the index child and murder of the sibling (appeal pending). The first child's death was found to be caused by salt poisoning.

Case 36

This 14-month-old child did not have an ALTE or demonstrate any abuse during the period of surveillance. Because of conflicting medical advice, social services professionals decided not to pursue the case in the court system. There had been one previous sudden infant death in an 8-month-old child by a different father after ALTE at ages 3 and 5 months.

Case 37

Surveillance revealed no abnormalities in the care of this 5-month-old child, and no ALTE occurred. However other evidence, including a physiologic recording during an event, had suggested suffocation, and a care order was granted.

Case 38

There were only 3 hours of surveillance on this 9-week-old infant, with both parents present throughout. The parents then decided not to continue to stay in our hospital. The child was subject to a series of interim care orders. Two years later, the mother admitted causing the ALTE by suffocation.

Case 39

The mother admitted fabricating near-death events and falsely alleging that a previous sibling had died of SIDS. To assist with these fabrications, she had fraudulently obtained a death certificate on this nonexistent child. Surveillance ended when the mother was informed by telephone by a member of a pressure group, Mothers under Munchausen, that she was under observation. The patient became the subject of an interim (temporary) care order but was eventually reunited with his mother.

Other Observations on the Patients

Petechial Hemorrhages and/or Bleeding

Three of the 30 cases in which CVS revealed suffocation, and 1 additional patient had previously

shown petechial hemorrhages around the face, conjunctivae, or throat (Table 3). None of the controls had petechial hemorrhages on the face or upper chest reported or observed in association with their ALTE. None of the CVS patients had signs or history of bruising around the mouth. However, in 9 of the 30 cases of documented suffocation and in 2 other cases (24 and 37), bleeding from the nose or mouth had been reported after ALTE that occurred before CVS was implemented. This was in contrast to the fact that none of the 46 control patients had bleeding from the nose or mouth in association with their ALTE ($P \leq .0001$; χ^2 test). Three siblings of the CVS patients also had ALTE involving bleeding from the nose or mouth; all three subsequently died (classified as SIDS). Two additional siblings, who had ALTE without bleeding from the nose or mouth, subsequently died (classified as SIDS), and there was fresh bleeding from the mouth and nose at the time of death.

Deaths in the Siblings of the 39 Patients Who Underwent CVS

Twenty-eight of the 39 patients undergoing surveillance had a total of 41 siblings. Twelve had died suddenly and unexpectedly. In 11, death was attributed to SIDS (although 1 patient was 22 months of age at death) and in 1 to gastroenteritis. Of the 11 classified as SIDS, four parents admitted deliberate suffocation in 8 of their children after being confronted with the evidence obtained by surveillance of the index child. Two of these deaths by suffocation were caused by stepparents of the children. The death attributed to rotavirus gastroenteritis was subsequently determined by the court to be caused by deliberate salt poisoning by the mother (case 32).

There were 52 siblings in 43 of the 46 control cases. One had died at 7 weeks of age (classified as SIDS) and 1 had died of hypoplastic left heart syndrome at 5 days of age.

The difference between the numbers of siblings who died suddenly and unexpectedly in CVS patients versus controls was significant ($P \leq .0001$; χ^2 test).

The median, interquartile range, and range of ages at the first reported ALTE, corrected for the expected

TABLE 1. Clinical Characteristics of Patients and Controls

	CVS Patients	Control Patients
ALTE receiving CPR	30	46 (respiratory, n = 37; epilepsy, n = 9)
ALTE without CPR	6	
Failure to thrive	1	
Suspected strangulation	1	
Reported epileptic seizures	1	
Age at first ALTE in months, corrected to EDD		
Median	3.6	0.3
Range	0.1–32.5	–2.7–10.4
IQR	1.2–5.6	–0.5–1.8
Sex ratio (M:F)	19:20	32:14
Preterm birth		
< 32 weeks	0	20 (respiratory, n = 19)
32–36 weeks	3 (32, 36, 36)	7 (respiratory, n = 6)

date of delivery (EDD), in cases and controls are shown in Table 1. Ages corrected for EDD at the time of the first ALTE are significantly higher in the CVS patients than in the comparison group (Mann-Whitney *U* test; $P = < .001$) (see the Figure). The median EDD corrected age was 3.6 months in CVS patients and 0.3 months in controls.

Investigations Before CVS in Children Whose ALTE was Attributable to Attempted Suffocation (n = 30)

In nine children, arterial blood gas analyses were noted to have been performed within 2 hours of an ALTE. The more severe events had the more abnormal results: pH, 7.13 to 7.40; P_{CO_2} , 3.5 to 6.0 kPa; bicarbonate, 9 to 22 mmol/L; base deficit, 4.0 to 14.7 mmol/L.

Blood counts were performed within 2 hours of an ALTE in 10 children. The more severe the event, the higher the white blood cell count, with a predomi-

nant relative lymphocytosis. The most severe event seen produced a total white blood cell count of $44.0 \times 10^9/L$, with 17% neutrophils, 80% lymphocytes, and 3% monocytes. Other total white blood cell counts ranged from 15.0 to $28.9 \times 10^9/L$ (median, 19.2).

A pneumomediastinum and a pneumothorax were seen in one child (case 13). Computed tomography of the brain showed hypoxic ischemic injury in another (case 20). This patient required intubation and a thio-pentone infusion to control status epilepticus resulting from an episode of suffocation occurring before CVS.

DISCUSSION

Findings of Surveillance

We have shown that CVS can readily identify parents who intentionally suffocate their children and thereby induce or fabricate illness, a behavior called Munchausen syndrome by proxy (MSBP).²⁴ We have also shown that parents may abuse their children in other ways. Thus we avoid the term MSBP because it does not describe adequately the range of abuse that occurred; we prefer to describe the actual abuse identified. Although attention-seeking through induced illness (ALTE, poisoning, or failure to thrive) was always a feature of the abuse in our patients, there were frequent additional abuses. CVS identified other serious physical and emotional harm, reflecting a severely dysfunctional relationship between parent and child (Tables 3 and 4) that would not otherwise have been brought to the attention of health or social services professionals.

Abuse was inflicted without provocation and with premeditation and, in some instances, involved elaborate and plausible lies to explain consequences. We wish to emphasize the plausibility of many explanations and histories given by such parents. For example, one mother (case 13) claimed that she had suffocated her son because of stress related to his crying and continually waking her from sleep. It is possible to empathize with this kind of stress. However, under surveillance, the mother was seen, with premeditated planning, to suffocate her infant when he was deeply asleep. The majority of other cases showed attempted suffocation when the child was asleep or lying passively on the bed. Children did not appear to provoke their parents into abusing them.

In some children, abuse was inflicted frequently, if not almost continuously (see "Logs of Selected Observations," below). That it was detected in the caring and child-centered environment of a hospital raises the possibility that even more severe abuse may have been inflicted at home. Defense witnesses have testified in court that the stress of being in a hospital may have led some parents to abuse their children. We do not accept this argument. Moreover, the median duration of CVS was only 29 hours. In our opinion, all of the abuse detected would have occurred regardless of whether CVS was being implemented.

The sadistic nature of the abuse inflicted in a number of our patients is reminiscent of other child abuse

TABLE 2. Key Findings in the Family Histories of the 39 Patients Undergoing CVS

	Number of Cases
Fabricated or induced illness in parent	25
Alleged illness without diagnosis	22
Induced illness/injury	4
Personality disorder in parent diagnosed by psychiatrist	23
Allegations by parent of sexual abuse or rape	17
False ⁸⁷	5
Unknown	12
Deliberate self-harm in parent (drug overdoses and self-mutilation)	15
Nonfatal abuse in siblings of patients undergoing CVS (excluding ALTE)	15
Proven/admitted	12
Suspected	3
Allegations by parent of physical abuse	10
False ⁸⁷	1
Unknown	9
Severe behavioral problems in parent as a child/adolescent	10
Families with sudden and unexpected infant/child deaths	9
Criminal behavior in parent (excluding abuse of index child)	9
Ingestion of drugs/toxic substances in siblings	5
Proven abuse	1
Suspected abuse	4
Miscellaneous unusual activities of parent	
Involved with fires	3
Extensive involvement with the media	3
Falsely alleged to be a nurse	2
Cruelty to pets	2
Marital state of parent	
Married	19
Single without partner	11
Single with partner	4
Divorced	5
Age of parent at time of birth of index patient	
>20 years	29
17-19 years	7
≤16 years	3

For the purpose of this Table 2, parent is defined as the person suspected of having or proven to have abused the patient.

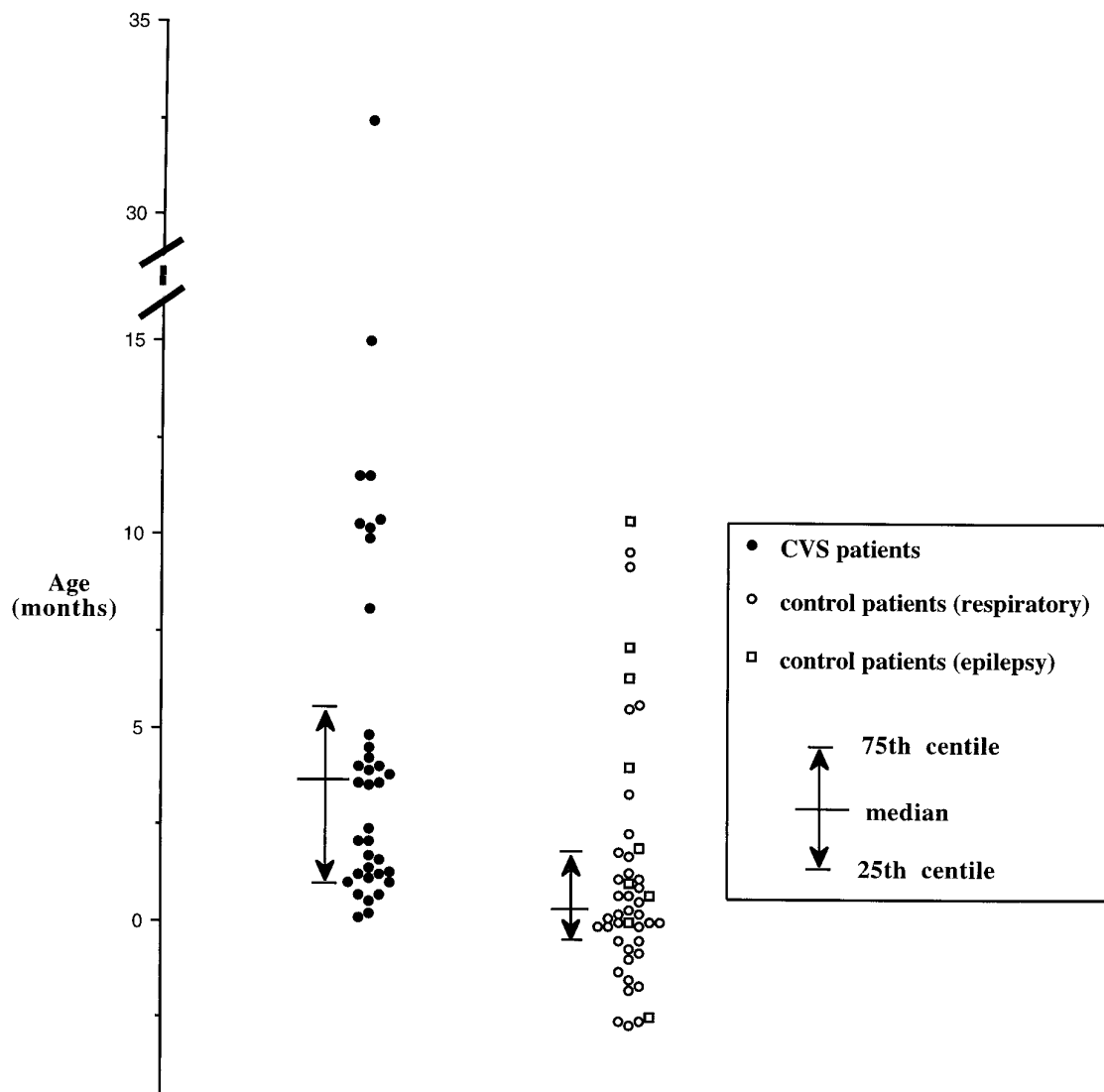


Figure. Reported age at first ALTE, corrected to EDD, for patients undergoing CVS and control patients (Mann-Whitney *U* test, $P < .001$).

in which brutal injuries, such as cigarette burns or multiple fractures of different ages, are pathognomonic. It is difficult, for example, to accept that placing a burning cigarette on a child's body could represent a legitimate form of punishment or an impulsive act of anger. Among possible explanations for this behavior and that seen during CVS is that it gives some form of gratification to the perpetrator or that it is a learned behavior from the parent's own childhood. Although the origins of these abusive behaviors may be genetic or may result from earlier traumatic experiences during the abuser's childhood, or both, the mechanisms whereby such factors are translated into abusive behaviors in the next generation remain poorly understood.

Another issue raised by these observations is the difficulty many health professionals, relatives, and others may have in accepting the possibility that parents would deliberately abuse a child in ways revealed under surveillance. Professionals and members of the judiciary, who have not seen abuse in action as shown by CVS, may be almost unable to

acknowledge that such acts can be and are committed by apparently caring mothers, fathers, and step-parents.

How Can Abuse Be Identified as a Cause of ALTE?

In 1986, National Institutes of Health defined ALTE as "an episode that is frightening to the observer and that is characterized by some combination of apnea (central or occasionally obstructive), color change (usually cyanotic or pallid), marked change in muscle tone, choking or gagging."¹² ALTE is a combination of symptoms and signs arising from a number of mechanisms.

Most of our patients presented with recurrent near-death events requiring CPR; as a group, these patients are known to have a very high risk of sudden death.²⁵ In our experience,¹⁴ such events are rare in otherwise healthy infants and children and are attributable to three primary mechanisms: 1) a respiratory disorder, 2) epilepsy,²⁶ and 3) child abuse. Respiratory disorders have occurred predominately in the following settings: 1) in preterm babies in

TABLE 3. Information on ALTE and Surveillance

Case No.	Sex	Apparent Life-threatening Events				CVS			Outcome for Patient			
		Onset (Months)	Reported (n)	Documented Unwell (n)	Severity	Bleeding	Petechiae	Duration		Age (Months)	Instrument of Suffocation	Other Abnormal Observations Under Surveillance
1	M	4	21	19	CPR ×2, hypoxic convulsions	No	No	18 H	20	T-shirt	Aggressive to child when staff not present	Adopted
2	F	1	6	6	CPR ×1, pale, sweating, tachycardia	Nose	No	4 H	6	Vest	None	Severe self-mutilation, pinches, fingers in throat, head-banging/long-term care to father
3	F	2.4	9	9	CPR ×5, fits	Mouth	No	2 D	5	Domestic plastic film, then pillow	Disconnected monitors	Adopted
4	F	3.8	10	9	CPR ×4, cyanosed, shocked	No	Face and scalp	12 D	7	Hand	Poor interaction	Returned to parents
5	M	10.2	24	19	CPR ×7	No	Conjunctivae, neck ×2	24 H	17	Hand	None	Adopted
6	M	1.2	9	8	No CPR, acidotic	No	No	2 D	3	Duvet	Disinterested unless nurse or doctor present	Adopted
7	F	4.2	7	7	CPR ×3, hypotonic, cold, shocked	No	No	1.5 H	5	Fingers down throat induced vomiting ×2	Said she was feeling teeth during event, then joked with nurses/rough handling/bit through monitor lead to disconnect it	Adopted
8	M	4.5	13	9	CPR ×3, acidotic, fits	No	No	45 Min	6	Hand	None	Fostered
9	F	4	>50	7	No CPR, cyanosed, hypotonic	Mouth	No	15 Min	9	Hand	None	Fostered
10	M	1.1	6	6	CPR ×3, cyanosed	No	No	24 H	8	Hand	Swore at patient/unusual kissing	Adopted; mother changed name and left country, becoming pregnant on 2 occasions; both children into care on being discovered
11	M	1	10	10	CPR ×5, zero value on TcPO ₂ signal > 4 min	Nose	No	3 H	3	Duvet	None	Severe behavior disorder, learning difficulties, cerebral palsy; long-term care to father

TABLE 3. Continued

Case No.	Sex	Apparent Life-threatening Events					CVS			Outcome for Patient		
		Onset (Months)	Reported (n)	Documented Unwell (n)	Severity	Bleeding	Petechiae	Duration	Age (Months)		Instrument of Suffocation	Other Abnormal Observations Under Surveillance
12	F	0.7	10	10	CPR ×5	No	No	29 H	4	Hand	Not recorded	Returned to mother (grandmother was perpetrator) Care by maternal grandparents
13	M	1.6	7	7	CPR ×2, pneumothorax and pneumo-diastrinum	Nose and mouth	No	9 H (alone 15 min)	6	Hands	Verbal abuse	Care by maternal grandparents
14	F	32.5	7	7	CPR ×2, cyanosed, fits	No	No	36 H (mother home at night)	35	Hands	None	Cerebral palsy, anticonvulsant for fits; adopted; mother admitted
15	F	15.3	7	7	CPR ×1, acidotic, cyanosed	No	No	3 H, 15 min	17	Hands	Little contact; baby cried, slapped and told to shut up	Care by paternal grandparents
16	M	3.9	9	5	CPR ×3	No	No	47 H	9	Hand	Slapped 5×, lacked interaction in nurses' absence	Care by father
17	F	3.3	>13	7	CPR ×3, fit	No	No	26 H, 30 min	13	Sweater	None	Care by father; mother left country
18	M	11.5	6	6	CPR ×2, stridor, cyanosed	No	No	43 H	13	Fabric	Changed from suffocation to cuddling when nurse entered; episode of struggling resulted in red mark around neck	Care by father
19	F	11.5	8	0	CPR ×1, cyanosed	Nose and mouth	No	9 H	17	Hand	None	Long-term foster care; mouth injury admitted to by mother
20	M	3.5	5	4	CPR ×3, status epilepticus needing thiopentone infusion; focal fits with ↓ SaO ₂	No	No	4 H, 40 min	4	Fingers up nose, hand	None	Anticonvulsant for fits, cerebral palsy, behavioral problems, cortical blindness; care by maternal grandparents
21	M	3.6	9	9	CPR ×3	No	No	50 Min	5	Hands and cloth	None	Care by maternal grandmother
22	M	0.7	4	4	CPR ×1	No	No	9 D	2	Hand	See case history	Care by mother (father was perpetrator)

TABLE 3. Continued

Case No.	Sex	Apparent Life-threatening Events					CVS			Outcome for Patient		
		Onset (Months)	Reported (n)	Documented Unwell (n)	Severity	Bleeding	Petechiae	Duration	Age (Months)		Instrument of Suffocation	Other Abnormal Observations Under Surveillance
23	F	2.1	4	4	CPR ×2	No	No	60 H	3	Bib	Switched off monitor; slapped twice; forced dummy into mouth	Long-term foster care; mother became pregnant; identified after verbally abusing a child in the street; subsequent baby adopted
24	F	1.2	7	6	CPR ×1, cyanosed, shocked	Nose and mouth	No	3 H	3	None	Fractured left ulna and radius; verbally aggressive (see log); shook baby	Adopted, subsequent baby removed
25	M	8.1	5	5	Cyanosed	Nose and mouth	Lips	33 H	9	Hand	Hit on face; smacked; swore at child	Long-term foster care
26	M	10.4	8	4	CPR ×1, cyanosed	No	No	49 H, 30 min	13	Hand	Disturbed child from sleep and hit around the head	Care by father
27	F	10.8	4	2	Pale, floppy	Mouth	No	49 H	19	Pillow	5×; inattentive to baby	Prepared blankets for suffocation
28	M	10.3	>10	1	Cyanosed, floppy	No	No	4 D	15	Hand	Shaken roughly when cried; little interest when alone; overtly affectionate in presence of nurses	Care by paternal grandparents
29	F	1.4	2	2	Shocked	No	No	9 D	5	None	Pushed head into pillow; repeatedly rough handling; some shaking but not violent; swore at baby	Adopted
30	F	None	N/A	N/A	Not relevant	No	Face, neck, chest ×3	6 D	20	None	None; normal loving relationship between mother and child; very little observation of father alone	Long-term foster care (to mother's foster parents)

TABLE 3. Continued

Case No.	Sex	Apparent Life-threatening Events				CVS			Outcome for Patient			
		Onset (Months)	Reported (n)	Documented Unwell (n)	Severity	Bleeding	Petechiae	Duration		Age (Months)	Instrument of Suffocation	Other Abnormal Observations Under Surveillance
31	F	0.2	>35	1	Alleged "pale, fighting for breath, blue, vomited"	No	No	5 D	27	None	Hitting child on mouth ×2; fabrication of ALTE, fit; alleged oedema hands and face	Care by mother under social services care order
32	F	None	N/A	N/A	Not relevant	No	No	6 H	44	None	Toothbrush rammed down throat, probably to induce vomiting; gave disinfectant via nasogastric tube	Long-term foster care
33	M	4.8	5	2	CPR ×2, IPPV for 15 days, bloody pulmonary oedema at intubation, thereafter O ₂ dependent, fits	Nose	No	70 H	9	Hand	Mother discontinued his oxygen; swore at him; smacked him; pulled off bib roughly; he seemed frightened by his mother	Adopted; home oxygen required for lung damage resulting from ventilation required for ALTE attributable to suffocation
34	F	0.1	> 5	2	CPR ×1, acidotic, cyanosed	No	No	77 H	18	Pillow	See log and case history	Adopted
35	M	None	N/A	N/A	Not relevant; alleged fits	No	No	6 H	34	Hand	Poisoning with carbamazepine (see case history)	Adopted by maternal grandparents
36	F	1.3	17	12	CPR ×6, "nearly dead" according to father, cyanosed	No	No	15 D	14	None	Poor emotional interaction with patient unless father or nurses were present	Returned to care of parents after interim care order but no full court hearing of evidence; ALTE did not occur after CVS
37	F	3.6	6	5	CPR ×1, cyanosed	Nose	No	7 D	5	None	No information	Long-term care by maternal grandmother
38	M	1.7	5	3	CPR ×2, shocked	No	No	3 H (parents together)	2	None	None	Long-term foster care, anticonvulsants for residual fits; mother eventually admitted suffocation
39	M	0.5	>25	2	CPR ×2, O ₂ given by paramedic at mother's request, she falsely alleged performing CPR	No	No	25 H	9	None	Warned about CVS by phone; put one of child's meals in bin (instead of feeding infant)	Returned to care of mother

The number of ALTE reported refers to information received from the parents and must be considered with caution. In many cases, however, the numbers concurred with those reported by the referring hospital. Information on whether the child was unwell during events was more objective, originating from paramedics, nurses, and doctors.

whom some ALTE may be considered a form of apnea of prematurity; 2) during respiratory infections²⁷ such as bronchiolitis attributable to respiratory syncytial virus; 3) as a severe form of cyanotic breath-holding²⁸; and 4) in response to severe gastroesophageal reflux.²⁹ All of these may involve sudden intrapulmonary shunting.³⁰

Child abuse as a cause of ALTE is the most difficult to diagnose. In our patients, bleeding from the nose or mouth in association with an ALTE distinguished intentional suffocation from ALTE attributable to natural causes. Having a sibling die suddenly and unexpectedly also occurred significantly more frequently in the abused group. Petechial hemorrhages of the face were identified in three patients (as described previously by Meadow in 5 of 27 cases of intentional suffocation),³¹ but were not found in the comparison group. Preterm birth was more common in infants suffering ALTE resulting from a natural respiratory mechanism, and the onset of ALTE resulting from natural causes occurred at an earlier age. Finally, the increased white blood cell counts, usually with a lymphocytosis, determined after some suffocatory events may mislead doctors into suspecting infection as the cause.

The background of parents who abused their children revealed important indicators of abuse as potential causes. Our earlier reports^{9,10} showed that all 14 parents who had abused their children had personality disorders. No systematic psychiatric assessment was performed on the latter 25 patients in this report, and only 9 of these were described as having a personality disorder after individual psychiatric consultations. Two parents refused assessment. There was variability in the quality of background information available, and some psychiatrists were not willing to provide us with their reports.

Although there is a growing recognition of the comorbidity of psychiatric disorders (especially depression, anxiety, and substance abuse) among parents who abuse children,³²⁻³⁴ these were not found in our patients. No parent had a psychotic mental illness. It is possible that in some patients, the diagnosis of personality disorder lead professionals to give less attention to associated psychiatric symptoms, given the known difficulties of successful therapeutic engagement. It is also possible that some of these parents were themselves resistant to psychological intervention and focused instead on physical symptoms in themselves (somatization) or on inducing or fabricating illnesses in their children.³⁵ Sometimes overt Munchausen's syndrome was present in the parent (Tables 2 and 4). Many parents spent much of their time speaking about how badly life had been for them, using fabrication to invoke sympathy from listeners.

It is beyond the scope of this report to review the conceptual and therapeutic controversies about personality disorder or the difficulties in defining it. However, despite valid concerns about labeling and measuring this heterogeneous group of disorders, personality disorder has been described repeatedly in anecdotal, clinical, and psychodiagnostic studies of parents who abuse children.³⁵⁻³⁹ In a controlled

study involving a structured interview of 54 mothers who abused their children, Famularo et al³³ found an increased incidence of personality disorder. Furthermore, personality disorder has been reported to have a predictive value for emotional and behavioral problems in children.³⁴

Psychiatrists and psychologists have researched ways of identifying and classifying personality disorders. Techniques, including validated questionnaires, are available, although the more intrusive the initial investigation, the more elusive the response of the abusing parent may be. There are a number of different personality disorders, and additional research is needed to define more effectively those most likely to lead to the abuse of children, particularly the sadistic and pervasive types described here.

To predict the risk of child abuse, lists of risk factors have been developed. Although they may be of limited predictive value,⁴⁰ they can form a basis to develop risk-assessment strategies. The data in Table 2 present some of the features we identified along with their frequency of occurrence. Refined techniques to identify persons who may inflict severe abuse may also be useful to screen others who have close contact with children, including foster parents, babysitters and carers, nurses, doctors, social workers, humanitarian aid workers, and teachers.

Finally, in a proportion of families, the mother reported major difficulties in her relationship with her partner/husband. Some partners were passive and alleged to be relatively uninvolved with their families, giving little support to the mother. Others allegedly were abusive to the mother. In some families, the father/partner was insecure in his commitment to the mother; we considered that the mother may have harmed the child as a way of maintaining the relationship. For example, on the evening that her partner walked out of the home claiming he was leaving her, one mother (of patient 36, and already under investigation after 14 apneic/cyanotic episodes), presented her child to the hospital with a series of three ALTEs, one of which had features on a physiologic event recording suggestive of upper airway obstruction. The mother of patient 37 alleged that her partner had threatened to leave her if she continued to care for her child (Table 4).

In addition to sudden death (as described above), abusive incidents occurred in 15 siblings (Tables 2 and 5). Such events should also highlight abuse as a possible/probable cause for ALTE.

Additional features of risk identified by others and seen in some of our cases include 1) the dramatic nature of the presentation, with parents implying or claiming to have saved the infant's life; 2) a tendency for events to occur when the parent is awake and when they are stressed; 3) absence of an independent observer at the onset of events. In this feature, the key words are *independent* and *onset*. A proportion of parents who suffocated their children provided stories of others witnessing some part of the events. Usually, observers had not seen the events begin; they were often called to help resuscitate the infant. Perhaps not surprisingly, some witnesses were friends or relatives who had been persuaded by the

TABLE 4. Information Before Surveillance

Case No.	Documented Medical History of Note (Including Unsubstantiated Symptoms) and Concerns of Medical/Nursing Staff	Key Substantiated Family Issues/Problems With Caregiver	Psychiatric Assessment	Previous Social Services Involvement
1	None documented	Overdose $\times 1$; falsely alleged pulmonary embolus in pregnancy ⁸⁸ ; alleged sexual abuse by grandfather and physical abuse by father	Yes, personality disorder	Support because father of patient (age 49) had angina
2	Nosebleed at 7 weeks; rough handling noted by nurses	Overdose $\times 2$; convictions for theft and deception; alleged physical abuse by father	Yes, personality disorder	None documented
3	Failure to thrive with vomiting and diarrhea (allegedly containing blood)	Overdose $\times 1$; multiple complaints of knee injuries; fainting; anorexia nervosa	Yes, abnormal help-seeking reaction of dissociate kind	None documented
4	None documented	Severe conduct disorder during childhood. Alleged sexual abuse.	Yes, personality disorder	Mother in care aged 8–16 years
5	Bruising of toe (17 months); 2 episodes of unexplained screaming on the ward (child appeared frightened of mother)	Alleged (falsely) apneic episodes and fits at age 13 years; treated with anticonvulsant drugs; theft and lying (age 15 years)	Yes, personality disorder	None documented
6	None documented	Overdose $\times 3$; psychogenic faints and fits; treated with anticonvulsant drugs; alleged sexual abuse by uncle	Yes, personality disorder	None documented
7	Admission at 5 months when mother dropped child who injured head; mother seen by nurse to handle baby very roughly; seemed unconcerned by baby's crying; baby appeared agitated when with mother	Overdoses $\times 2$; self-mutilation; inpatient for 9 weeks during pregnancy with alleged premature labor ⁸⁸ ; Alleged sexual abuse by stepfather	Yes, personality disorder	Mother in care (age 13–17 years) in multiple institutions/foster homes. When under influence of alcohol tried to remove her baby from foster care
8	None documented	Alleged violence by partner	Yes, personality disorder	None documented
9	Abnormal marks on face and chest; history of vomiting with blood seen on bib (no bleeding point found)	Alleged sexual abuse as a child in which mother held her down for stepfather; alleged physical abuse by her father; tried to terminate her own pregnancy ⁸⁸ ; alleged that husband was abusive; overdoses $\times 2$	Yes, personality disorder	Mother in care as a child-problems with her mother
10	Observed to be handling child roughly (when mother was unaware of being observed, before CVS)	Violent to pets and sister as a child; smeared feces on wall at school; alleged rape; had faints, no cause found; abducted baby of another family from hospital; alleged fall with hip injury when pregnant ⁸⁸ , no injury found on admission; overdose $\times 1$	Yes, personality disorder	Attended school for behaviorally disturbed children. "Family well known to social services"
11	None documented	Involvement with police at 13 years with soliciting and at 15 years because of pornographic photographs; 2 firebombs at home (unexplained); overdose $\times 1$; falsely alleged rape; unexplained alleged fits	Yes, personality disorder	20 referrals concerning alleged abuse of the child to Social Services/HV/police; investigated, no action could be taken
12	None documented	(Child's maternal grandmother) alleged chest pain and hemoptysis; multiple abdominal operations (no known pathology); alleged (falsely) multiple fractures; alleged sexual/physical abuse by her father	Yes, personality disorder	None documented
13	None documented	None documented	No information	None documented

TABLE 4. Continued

Case No.	Documented Medical History of Note (Including Unsubstantiated Symptoms) and Concerns of Medical/ Nursing Staff	Key Substantiated Family Issues/Problems With Caregiver	Psychiatric Assessment	Previous Social Services Involvement
14	Head injury (age 7 months); failure to thrive with developmental delay (age 11 months), which responded to separation from mother; child disclosed that mother responsible for bruises on neck and red marks after bath; fall with cut lip and chipped teeth and alleged fall out of cot with head injury (age 21 months)	Dismissed from 2 jobs	Yes, personality disorder	Adoption proceedings, which were curtailed by mother when infant aged 5 months
15	Fractured rib; nurse worried about mother's bathing technique; mother placed head almost under water; bib tied tightly around neck by mother	Violent bully at school; in care as teenager because of uncontrollable behavior (alcohol abuse and theft); alleged epilepsy; charged with murder and arson but successfully alleged self-defense against rape; flooded hospital ward; set fire to hospital curtains	Yes, personality disorder	On register for neglect; lied to HV about advice of another; social worker and HV stated "no cause for concern," "appears to be coping and caring appropriately"
16	Severe excoriated diaper rash; screaming (from child) heard while alone with mother on the ward; mother observed by nurse to shout at baby	Falsely alleged terminal illness and that a prominent specialist had cured her; falsely alleged rape at bail hostel; falsely reported poison pen letters; falsely claimed that her child was a twin and the other had died ⁸⁸ ; house exorcised of ghost at her request; fires in the home ×2 (unexplained)	Yes, personality disorder	Mother said to have puerperal psychosis after birth of previous sibling
17	Unexplained codeine in urine; severe constipation; unexplained blisters and erythema in diaper area; failure to thrive and anemia (requiring blood transfusion), no cause found	Repeated hospital admissions in pregnancy ⁸⁸ (no problem found); falsely alleged lost one twin during each of 2 consecutive pregnancies; in wheelchair after alleged bilateral hip replacements (but seen to crawl around cubicle under CVS)	None documented	Mother said to be unable to cope because of arthritis; multiple requests for social services benefits
18	Alleged hematemesis, no cause found; paracetamol, phenergan, colic drops administered concurrently resulting in reduction in level of consciousness and admission to hospital	Head banging as an adolescent; self-mutilation; truancy; anorexia nervosa; falsely alleged rape by father; falsely alleged death of twin in pregnancy ⁸⁸ ; alleged 7 miscarriages and 2 stillbirths (unsubstantiated); fabricated story to obtain 8 years of fertility treatment; alleged numerous knee problems, Raynauds, leukemia, receiving treatment at several NHS and private hospitals; alleged faints, compulsive drinking; galactorrhea, amenorrhea induced by oral contraceptive; falsely alleged to be auxillary nurse	Yes, personality disorder, Munchausen's syndrome	None documented

TABLE 4. Continued

Case No.	Documented Medical History of Note (Including Unsubstantiated Symptoms) and Concerns of Medical/ Nursing Staff	Key Substantiated Family Issues/Problems With Caregiver	Psychiatric Assessment	Previous Social Services Involvement
19	Stridor noted after an ALTE; bruising on cheek at 13 months; failure to thrive; lost tooth and damaged another at 15 months, reported by mother to have fallen on concrete floor (but floor in question carpeted); treated with anticonvulsants for alleged fits	Overdose ×2; slashed wrists (no threat to life); theft from work	None documented	Given telephone because of ALTE, said it was out of order at time of subsequent event, untrue when checked
20	None documented	Fall downstairs during pregnancy, thought to be attempt at ending pregnancy ⁸⁸ , resulted in bleeding	None documented	Left home while pregnant; lived in care; alone at birth; problems with mother's parents
21	Admitted shaking baby twice to stop crying; unusual mouth-kissing noted by nurses	Tried to strangle herself with a tie at 13 years; pregnant at 14 years, claimed to have resulted from rape at knife point (police investigation dropped, no evidence); alleged sexual abuse by cousin and babysitter as child; criminal record of theft	None documented	Family well known to social services
22	See case history	See case history	Yes, personality disorder and Munchausen's Syndrome	See case history
23	None documented	Falsely alleged hospital treatment; falsely alleged assault	None documented	None documented
24	See case history	See case history	Yes, personality disorder	See case history
25	Nurses noted that mother handled baby roughly	None documented	None documented	None documented
26	Head injury at 9 months, said by mother to have walked into furniture	Alleged sexual abuse as a child; alleged attempted rape; concealed pregnancy, said it was deliberately induced by boyfriend giving her alcohol; falsely alleged father had died in fire	None documented	None documented
27	Injury to right leg at 9 months; head injuries at 13, 16, and 17 months; fell downstairs, bruising head and injuring mouth; tangled in duvet and could not breathe at 17 months	Overdose ×1; alleged abuse by husband	Yes, personality disorder	Concerns about earlier born siblings
28	Pinch marks noted at 1 year; failure to thrive; excessive GP attendance with minor illnesses and 11 admissions to hospital; sister (age 6 years) described mother hitting baby and called neighbor	As a child, falsely reported to mother of her friend that the friend had been killed in a car accident; excessive GP attendance with unexplained symptoms; excessive hospital attendance during pregnancy with unexplained symptoms ⁸⁸ ; made hoax telephone calls	None documented	Patient investigated for pinch marks, no action could be taken as insufficient evidence of abuse; planned to marry convicted sex offender
29	None documented	Disruptive behavior as child; false allegation of rape	Yes, personality disorder	Mother was adopted as infant then abandoned (age 5 years) when parents emigrated, then in care
30	Seven fractures of different ages at 4 months, including femur, ribs, and humerus	None documented	None documented	Interim care order at time of surveillance

TABLE 4. Continued

Case No.	Documented Medical History of Note (Including Unsubstantiated Symptoms) and Concerns of Medical/ Nursing Staff	Key Substantiated Family Issues/Problems With Caregiver	Psychiatric Assessment	Previous Social Services Involvement
31	Failure to thrive in infancy necessitating IV feeding; recurrent IV line infections; unexplained diarrhea; falsely alleged (by mother) to have perforated ear drums, meningitis, renal failure, cystic fibrosis, hypoglycemia	Alleged rape as a child, then denied it; alleged rape by her brothers; alleged bitten by rabid dog; alleged celiac disease, petit mal epilepsy, urinary infections (unsubstantiated); close liason with media	Refused assessment	None documented
32	Severe failure to thrive (7.7 kg at 3.5 years), given growth hormone injections; multiple invasive tests including bone marrow; recurrent abdominal pains and vomiting, hypothermia, hypernatraemia, polyuria (all unexplained); repeated displacement of nasogastric tubes	None documented	None documented	None documented
33	Rough handling by mother noted by another parent, good handling in front of nurses; sudden unexplained cries; esophageal pH probe repeatedly displaced; seen to breathe cigarette smoke into infant's face; alleged bleeding from infant's ears	Overdose $\times 1$; cut wrists; repeated self-mutilation of arms; alleged sexual abuse by her father from age 7 to 13 years; alleged physical assault by husband; threatened husband with knife; falsely alleged contract killer had shot companion; gave false name to hospital; attended hospital with panic attack; repeated admissions for unexplained abdominal pain	Yes, personality disorder	Mother asked social services if foster care could be provided—this was refused
34	See case history	See case history	Yes, personality disorder	None documented
35	See case history	See case history	Yes, personality disorder	None documented
36	None documented	Overdose $\times 1$; recurrent symptoms (abdominal pain, fainting and ankle injury)—unexplained; memory loss for 2 days after “breakdown” in 1988; according to psychiatrist “wants to be there when she [her child] dies”; alleged abuse by her first husband; closely involved with media	None documented	Child protection team involved after arguments between parents; ALTE $\times 3$ on day father left home
37	None documented	None documented	None documented	Mother threatened to hurt baby if social services did not take her into care; foster care arranged but was canceled; boyfriend kept leaving and returning; on one occasion stating that he would permanently cease contact with mother if the baby came home from hospital
38	None documented	Headaches (age 10 years; no cause found); alleged excessive thirst and drinking (age 25 years; no cause found but responded to tranquilizers); alleged (falsely) she was had been an intensive care nurse; closely involved with media	None documented	None documented

TABLE 4. Continued

Case No.	Documented Medical History of Note (Including Unsubstantiated Symptoms) and Concerns of Medical/ Nursing Staff	Key Substantiated Family Issues/Problems With Caregiver	Psychiatric Assessment	Previous Social Services Involvement
39	False allegation of severe immunization response; mother said to nurses she felt like putting pillow over his face; blisters on pulps of left middle and ring fingers at age 2 months, said to have touched oven door; red line circumferentially around base of penis, suspicious of ligature; mark behind pinna noted by GP; unduly upset when face wiped by mother	Fainting attacks; recurrent unexplained severe abdominal pain; three convictions for obtaining property by deception, forgery, and shoplifting; falsely reported she had a 7-year-old daughter who was dying and obtained blank death certificate; alleged (in the local newspaper) burglary and theft of "dying" child's photo and video; on SIDS program for falsely alleged death of nonexistent sibling; said "baby might not be with her next week"; trained as a nurse	None documented	None documented

parent that the event was typical. However, almost all healthy babies stop breathing when they are asleep,⁴¹ and a number appear to turn blue around the mouth when crying.⁴² Such normal phenomena can be used by abusing parents as alibis for abuse; 4) cessation of events when the child is separated from the parent. However, in three patients not included in this study on whom we were unable to carry out CVS and in whom we used separation as a diagnostic test, expert witnesses argued that the children had suddenly grown out of their problem.

These findings support our earlier results^{9,10,14} and suggest new strategies for managing infants presenting with ALTE. The presence of bleeding from the nose and/or mouth and a family history of sudden death in childhood should dictate a full and forensic analysis of the family history, including information from social services and other child protection agencies, the police, accident and emergency departments, and the family doctor. There should be a low threshold for performing a skeletal survey, retinal examination, and brain imaging (to identify possible coincidental subdural hemorrhage). Siblings should also be examined and their records analyzed. The Child Protection and National Police Registers (in the United Kingdom) should also be reviewed. Such investigations should be conducted with discretion if CVS is a possible subsequent option.

The high proportion of surveillance circumstances that revealed abuse (33 of 39) stresses the importance of protecting patients in whom there is a similar index of suspicion (with or without the use of surveillance). CVS was initiated because members of a strategy planning group strongly suspected abuse, although in 10 of the 33 positive results, the children had been referred for medical investigations with no suggestion from the referring pediatrician that the ALTE may have been attributable to abuse. Based on our experience with the child protection system in

the United Kingdom, the specificity of the evidence available in the majority of patients is insufficient, without CVS, to ensure that child care proceedings are successful in protecting the child, particularly in the longer term. Only three children (cases 14, 32, and 35) were old enough to have developed sufficient verbal reasoning to recount what had happened to them. Interviews of such young children in a court are difficult, particularly for the children. During the period that we used CVS, we were also involved in child protection court proceedings in which there was no surveillance evidence, but in which we had the same index of suspicion of abuse. We were confronted by the plausibility of deceitful parents as well as by pediatricians acting as expert witnesses who were unable to accept what we considered reasonable evidence of abuse. The result was that a proportion of these children and their siblings were returned to parents despite our concerns that abuse of the type described here might continue. The absence of definitive evidence in these latter cases also resulted in lengthy court processes that delayed decision-making about the child's future. Although CVS could never be justified for financial reasons alone, an additional benefit was that shorter court proceedings enabled a limited social services budget to fund more resources to support other families in need. As a consequence, it is our view that CVS should become standard practice and used whenever possible to provide direct (noncircumstantial) evidence that will ensure effective and long-term protection. CVS also may be appropriate in investigating other abusive activity, particularly severe emotional abuse, involving parental deceit. This type of abuse should be regarded as extremely threatening to the child's mental and emotional health, and possibly fatal should it lead in later years to self-injury. However, the question arises as to what should be done if CVS cannot be implemented, as is currently the case

TABLE 5. Information on Siblings

Case No.	No. of Siblings at Time of CVS	Documented Features of Concern or Abuse in Siblings	Death in Siblings
1	2	Head injury at 7 months and ingestion of drugs at age 2.5 years; cyanotic episodes	No
2	1	Sister, 2.5 years, scalded, partial thickness burns to arm, chest and elbow, said to foster mother "Don't burn me"; refused to use shower, said "mum done it" when talking to foster mother; mother falsely alleged that she was also burned and needed treatment in casualty department	No
3	0	N/A	N/A
4	2	None documented	Sudden unexpected death in 3-month-old (classified as SIDS)
5	2	None documented	No
6	0	N/A	N/A
7	0	N/A	N/A
8	0	N/A	N/A
9	1	Mother reported by HV to have hit sibling	No
10	0	N/A	N/A
11	2	Allegations of abuse and/or neglect ×20 to Social Services in 5-y period; Sibling 1 had failure to thrive, head injury, scald on shoulder (9% burn); Sibling 2 had head injury at 8 months, mother alleged it was result of fall downstairs; also cut lip on 2 occasions	No
12	1	ALTE and fits; inadequate anticonvulsant drug levels; severe diaper rash; blood-stained secretions from mouth and nose with ALTE	Sudden unexpected death in 11-month-old (classified as SIDS)
13	1	ALTE and fits from age of 4 months; alleged hematemesis	Sudden unexpected death in 5-month-old (classified as SIDS); after being temporarily resuscitated, fresh blood in mouth and nose at death
14	1	None documented	No
15	0	N/A	N/A
16	1	Mother fell on sibling as infant, who could not breathe as a result; ingestion of washing powder; mother had mental health order during postnatal period (possible postnatal depression)	No
17	1	None documented	No
18	0	N/A	N/A
19	0	N/A	N/A
20	0	N/A	N/A
21	0	None (but sibling of mother had apneic episodes)	N/A
22	1 (Stepbrother)	ALTE requiring resuscitation at age 5 months	Sudden unexpected death at 6 months, temporarily resuscitated, fractured rib (classified as SIDS/bronchopneumonia)
23	2	Both had ALTE requiring resuscitation; first sibling had ALTE with bleeding from nose and mouth at age 10 weeks	Sudden unexpected death of both, age 12 weeks (temporarily resuscitated) and 2 months (both classified as SIDS)
24	1	Cigarette burns at age 17 months; temporarily delayed development (thought because of deprivation); ingestion of paracetamol; multiple GP attendances (35 in first 18 months of life)	No
25	1 (Stepsister)	ALTE at 14 months; stridor at 15 months; narrow trachea 1 cm long at 4 cm below vocal cords, operation to resect this undertaken at 21 months	Died at 22 months, 2 days after discharge after additional ALTE (stepmother admitted suffocation by holding hand over face)
26	1 (Halfsister)	None documented	No
27	2 Older siblings already adopted	1 had serious unexplained injuries including multiple fractures; mother convicted of willful neglect (also classed as Schedule 1 offender)	No
28	2	Sister regularly locked in bedroom; hit across face at hairdresser; poor school attendance; cigarette burn on foot; frequently left in care of others	One died of complications after preterm birth (32 weeks' gestation)

TABLE 5. Continued

Case No.	No. of Siblings at Time of CVS	Documented Features of Concern or Abuse in Siblings	Death in Siblings
29	3	2 of 3 had multiple ALTE involving in one bleeding from the nose and mouth	Sudden unexpected death of all 3 at 4.5 months, 3 weeks, 6 weeks (all 3 classified as SIDS); second infant had bleeding from mouth, at ALTE before death, this infant recovered, was sent home from hospital, died 2 h later; third infant had had multiple ALTE and bleeding from mouth and nose at time of death
30	1	None documented	No
31	1	None documented	No
32	2	Salt poisoning; ALTE; had severe failure to thrive leading to treatment with growth hormone	1 died at 23 months of deliberate salt poisoning (serum Na 193 mmol/L), cause of death determined to be gastroenteritis until CVS demonstrated poisoning and other abuse in the index case
33	1	Bruising at 7 months led to supervision order, mother denied causing bruises including marks inside mouth (thought caused by forced feeding); failure to thrive; mother when she cut her own wrists abandoned sibling	No
34	0	N/A	N/A
35	1	Admitted with alleged profuse vomiting, nurses thought alleged vomit was water	No
36	2	ALTE at 3 and 5 months in one sibling; love bite on daughter's face aged 8 years	Sudden unexpected death in 1 (history of ALTE) at 8 months (classified as SIDS)
37	2	None documented	No
38	2	Ingestion of bleach and fractured tibia in first sibling; falsely alleged 1 had undergone operation for intussusception; also alleged second sibling had vomited and passed blood in diaper, nurses examined vomit at mother's request, not acidic	No
39	1	Falsely alleged 1 death from SIDS at 10 weeks; falsified death certificate; falsely alleged 1 stillbirth	No

in our own unit because of adverse media activity, or in other countries where such surveillance may not be permitted by law. Our suggestion is that all child protection personnel be educated to recognize the type of abuse that involves deceitful and sociopathic parents, and that nonadversarial strategies, including the use of experienced, impartial professionals, be implemented by the court to determine the facts in these cases.

Strategies for Identifying and Protecting Children From Abuse Inflicted by Parents Who Intentionally Deceive

Many of the parents reported here were severely disturbed people who not only torment, but sometimes kill, their children or stepchildren. In most respects, they are *not* similar to parents who inflict more common forms of abuse in situations in which poverty, poor education, isolation, parental depression, alcohol abuse, unemployment, and lack of social and family support may have been present for generations. Such families have been described as "families without hope" by Tonge et al.⁴³ Injuries incurred by children in these families without hope may still be serious. However, our CVS group demonstrated abuse that was deliberate, sometimes

planned, and associated with unusual injuries or medical signs.

Child abuse has complex origins, but abuse that involves long-standing, sadistic, premeditated harm is potentially most damaging. In this severe form, there is a complex interaction of constitutional factors between parent and child, including personality traits, and broader family and other socioenvironmental influences that in some cases and at certain times result in abuse.³⁶ **Child protection programs are rudimentary in many countries, and even non-existent in others. Given the contents of the United Nations Convention on the Rights of the Child,⁴⁴ programs to address child abuse, particularly that involving parents with this form of psychological and personality disorder, must become a priority for all member states.**

In most families in which CVS was implemented, there were previous substantial concerns based on family and social histories, often known only to individual professionals. This illustrates the importance of basic clinical skills, such as the ability to collect accurate data and to work well with colleagues in different disciplines (interagency collaboration), as the key to diagnosis and protection.¹³ It is

often difficult to collect and analyze all relevant information;³⁶ there is a need for objective, critical, forensic methods of data collection from different sources. Taking a detailed history from parents (including a search for some of the factors outlined in Tables 2 and 4) is within the scope of responsibilities of all health and social service professionals. In our experience, a multiagency strategy meeting (professionals working together), initially without parental involvement, can be valuable in collating information and developing an effective strategy. It is less time-consuming than a case conference in which parents are present, and professionals tend to be less inhibited in their assessments. Also, if parents become alert to professional suspicion of the cause of the child's medical condition, they may attempt increasingly to disguise abusive behavior.

Family doctors and their health visitors (HVs) often have access to the information needed to identify parents with personality disorders who are potentially likely to inflict the types of abuse described in this report,⁴⁵ particularly because some will have attention-seeking behavior about their own health (Tables 2 and 4) as well as about the health of their children. Unfortunately, in our experience, most family doctors did not attend case conferences or play a significant role in child protection. This may reflect divided loyalties⁴⁶⁻⁴⁸ or the fear of legal repercussions, aggression from the patient's family, or media involvement. Systems should be established to make it easier, perhaps obligatory, for family doctors to participate more actively in the child protection process (as recommended by the UK Department of Health).¹³ Similarly, it is important that hospital and community-based doctors work together to identify high-risk families.

Perhaps the most critical observation, and the most difficult to address, is the ability of the abusing parents to deceive (see the account of Mary Bryk "My mother is an incredible liar and a powerfully deceptive actress").⁴⁹ Covert surveillance has revealed that many such parents appeared caring and kind in the presence of professionals, yet within seconds of being alone with the child, became cruel and sadistic. They were frequently charming and attractive people who revealed an ability to evade and deceive professionals from all agencies⁴⁷ as well as the media (see below). They are aptly described in the book *People of the Lie*.⁵⁰ Partnership with such parents may be simply ineffective or frankly dangerous in regard to the type of abuse described here.

A recurring experience encountered during our study was the tendency of some professionals to deny the possibility of life-threatening abuse. The perspective of these professionals can be dangerous. The attitude of optimism among social workers and others described by Dingwall⁵¹ still exists, and excessive reliance on partnership when the parent is determined to deceive has been documented previously. Sometimes inappropriate and dangerous alliances have developed between the abusing parent and health professionals involved in treating the child.⁵² On occasion, pediatricians were made to feel insensitive for addressing the potential role of abuse

in the cause of the problem, particularly in the presence of life-threatening symptoms and signs. We agree with Donald and Jureidini,⁵² who stated that severe abuse is more likely to occur when there is "a medical system that is specialised, investigation orientated, fascinated by rare conditions, often ignorant of abusive behaviours and too accepting of reported histories." This indicates the hazards of large specialist hospitals and investigative pathways that ignore psychosocial background.

It must be accepted that when working with parents who intend to deceive, agencies representing the interests of the child may have to work without parental collaboration. This results in a process geared more to child protection than to family support. A central issue that should be addressed at the onset of and during any child protection inquiry is determining how much trust can be placed in the parents. If they are already known to be deceitful and have features of a sociopathic personality disorder as described previously and outlined in Table 4, the identification of abuse and the protection of children may require a highly skilled investigative approach to the many deliberately placed obstacles to diagnosis.^{48,51-55} Such an approach is difficult in the care professions. Staff involved in such investigations need to cooperate effectively in a forensic setting to produce evidence that can withstand rigorous examination in the courts. Highly professional, well-trained, and suitably experienced staff and sufficient government resources are essential to ensure early identification of abuse by deceptive parents and to provide adequate protection for children. In addition, the efforts of effective staff and resources may eliminate criticism of social workers for failing to protect children from this kind of abuse.³⁴ In our experience, and according to studies conducted in both the United States and Australia,⁵⁶⁻⁵⁸ close cooperation with police and child protection professionals has provided important safeguards. We agree with the concepts raised by Boros et al⁵³ who have also implemented CVS to help detect this type of abuse. They classified it as a form of child torture and stated that "children must be protected and mentally competent adults must be held responsible for the violence they inflict." Further, they viewed "this entity more as a profile of criminal abusive behavior and less as a medical syndrome." This suggested approach is similar to that required to address child sexual abuse.

This analysis brings us to question child protection practices in the United Kingdom when dealing with such severe abuse. The current approach is to work with parents to overcome problems.¹³ The UK Department of Health guidelines on the Children Act emphasize "the importance of professionals working in partnership with parents and other family members [and] . . . fully involved from the outset in all stages of the child protection process and [with] . . . as much openness and honesty as possible between families and professionals." Inherently, this approach assumes that parents will collaborate honestly with the child protection team through registration, in case conferences, with care plans, and by

accepting home meetings from social workers or HVs (even when unplanned) designed to monitor and thereby provide some protection for the child. Parents who inflict the severe abuse described here may provide attractive homes and satisfactory basic care for their children, thereby deceiving some professionals during home visits. Knowing that they are under close observation may also lead some parents to greater levels of concealment. Partnership can be effective only when genuine.⁵

Relevance to Sudden Unexplained Deaths and Neurologic Disorders

Despite reservations about the selection of our sample, it is clear from these and other results^{31,32,35-36,59-64} that a number of sudden unexplained infant and early childhood deaths, including some labeled SIDS, is attributable to intentional suffocation. To date, there is no marker to identify intentional suffocation at postmortem examination. The proportion of SIDS attributable to intentional suffocation therefore remains unknown. However, child abuse is not uncommon. In 1995, there were 10.6 million children <16 years of age in England, 34 954 of whom were on Child Protection Registers (3/1000).⁶⁵ In 1995, 996 000 children (15/1000) in the United States were confirmed victims of abuse and neglect.⁶⁶ Although intercountry comparisons of incidence present difficulties,⁶⁷ in part because of differences in definition, these figures suggest that it is probably appropriate to conduct a careful, sensitive forensic investigation of all sudden unexpected infant and early child deaths where no explanation is found during examinations after death, including the autopsy. Skeletal surveys should always be considered. Multidisciplinary confidential inquiries after such deaths may also help to identify possible intentional suffocation or other abuse.⁶⁸ Such identification will not help the victim, but will alert professionals to the risk to subsequent children, siblings, and even children outside the family, and address treatment for parents, if they acknowledge their behavior.

The high number of deaths in previous siblings of our index cases, many of which were confirmed to result from abuse, highlights the intractable and long-term risk to children within these dysfunctional families.³⁶

A significant proportion of cerebral palsy and learning difficulties in children remains unexplained. In four patients undergoing CVS, hypoxic cerebral injury was likely to have been the direct result of intentional suffocation. As with sudden unexplained deaths, the precise contribution of suffocation to these clinical problems remains difficult to quantify. The potential contribution of abuse as a cause of permanent neurologic deficit was first described by Nixon and Pearn,⁶⁹ and has been championed by Oliver^{70,71} in his epidemiologic data from NE Wiltshire. The analysis of 140 children in two hospitals for children with learning difficulties⁷² suggested that violent abuse is a cause of between 3% and 11% of learning disabilities. However, because cerebral injuries may arise from subdural hemorrhage and suffocatory abuse, both of which may occur without

immediate clinically diagnostic findings, it was not possible to know the precise contribution made by each mechanism in Oliver's studies.

It is accepted that abuse is one cause of severe behavioral disorder in children.^{36,73-75} Our follow-up of severe behavioral disorder was neither systematic nor comprehensive and we almost certainly under-represent the frequency of this problem.

How Common is Severe Life-threatening Child Abuse?

Our data are selected primarily by referral from a large number of district hospitals. A recent survey by the British Paediatric Association Surveillance Unit⁷⁶ found 128 examples of MSBP that had reached a child protection case conference in the United Kingdom and Ireland during a 2-year period. Although this may appear relatively rare (0.5/100 000 children <16 years of age), there are undoubtedly many cases in which suspicions are not followed up. Carefully tracking a cohort of families in NE Wiltshire, Oliver³⁶ revealed at least 39 cases of intentional suffocation during a 20-year period in a population of 200 000 people (~1 in 25 000 children).

Practical Difficulties in Implementing CVS

Although guidelines had been made about the timing of intervention during suffocation, it was always difficult to specify with precision when to interrupt abusive behavior by parents. Our opinion, supported by experience in the court system, was that the demonstration of abuse that did not involve suffocation, poisoning, or injury, however unpleasant and distressing for the child, would not ensure protection. Therefore, we adopted an approach that we felt would result in the best outcome for each child. The log of case 24 illustrates the dilemma for observers faced with abusive behavior that did eventually result in an injury to the infant. During observation of the events leading to the injury, we had decided to intervene only if the mother's behavior was considered sufficiently violent to produce or be about to produce an injury. Without seeing the videorecordings for the logs, it is difficult for the reader to know precisely the degree of violence that accompanied, for example, a slap to the infant's head or an episode of shaking. We might be criticized for risking a serious injury such as a subdural hemorrhage and, in retrospect, we might have avoided the incident in which the child's arm was fractured. We acknowledge that the risk of an unexpected violent act is a potential problem during CVS and that more discussion and experience are needed to minimize the risk of such adverse outcomes. However, we would argue that CVS per se cannot be deemed responsible for these injuries as evidenced by the suffocation of previous infants at home in a proportion of these families. Furthermore, we reiterate our views expressed above, that actions on suspicion of abuse before implementing CVS may not ensure protection.

Helping Parents Who Inflict Severe Forms of Abuse

There are many child abuse situations where the context of family dysfunction lends itself to success-

ful intervention through a partnership between parents and professionals.⁷⁷ There is also evidence of effective treatment in some cases of the kind of abuse described here, but only when there is parental acceptance of the problem⁷⁸ (which is rare in our experience) as well as statutory intervention. Outcomes appear less favorable when there is short-term or less intensive intervention.^{53,54,74,75,79–82}

In parents with problems with their partners (see above), resolution of these difficulties might also contribute to the prevention of additional abuse.

Unfortunately, much of the literature on adults with personality disorders suggests that it is difficult to change behavior within the time limits required to make suitable decisions for the long-term care of young children. Parents may not wish to change and may not continue to attend psychotherapy or counseling sessions. Given the devastating effects they may have on children, and the usually intractable nature of the abusers' difficulties and their poor prognoses, children who are subject to severe abuse may have to be removed from the parents' care unless and until their safety and well-being can be ensured.

Role of the Media

There is no doubt that the media may be instrumental in raising awareness of child abuse, as exemplified in 1996 in the campaign by *The Independent* (United Kingdom) publicizing abuse in childrens' homes. However, attention-seeking is usually an important part of the lifestyle of these parents. Media attention is thus attractive to them, and their assistance may be sought after a disclosure of potential abuse. Convincing evidence acquired by CVS has usually inhibited parents from approaching the media. However, questions about abusive parenting from less stringent evidence lead to efforts by abusers to counter accusations by manipulating public opinion through the media. A trial, usually resulting in an innocent verdict for parents, is seemingly readily achieved by the media, although reporters are unable to hear evidence held by professionals because of appropriate confidentiality considerations for protection of the child. By collusion with abusive parents and the need for sensational stories, the media have made CVS difficult to implement in our hospital, thereby eliminating an effective form of child protection. The media would also appear to have been a major contributor to the crisis in diagnosis and management of child sexual abuse that resulted in a public inquiry into child abuse in Cleveland, United Kingdom, in 1987.^{83,84} Others have criticized the media in the United Kingdom^{85,86} for its approaches to child abuse reporting and the resulting negative impact on child protection practices.

CONCLUSIONS

A proportion of serious child abuse is inflicted by severely disturbed, deceitful but plausible parents. This abuse may be difficult to recognize, life-threatening, and associated with extreme degrees of physical and mental harm that are difficult to imagine. CVS has an important role in the detection of this abuse.

Child protection in the United Kingdom is based on the concept of working together. Although inter-agency and interprofessional collaboration is vital, partnership with parents—a process based on trust—would have failed to identify or protect most of these children. Severe abusive behavior may be less amenable to supportive family interventions and may require more assertive methods of investigation and decision-making. If the suffering that results from this kind of abuse is to be avoided, all countries must develop effective child protection services.

LOGS OF SELECTED OBSERVATIONS MADE DURING CVS

Case 22, 6-Week-Old Boy

Day 1

Time, 22:51 PM: the father said to the infant, "I will bounce you off the canteen roof."

22:52 PM: the father said to the infant that when the infant became older he "will beat, whip, remove fingernails, and amputate his limbs."

Day 2

Time, 14:03 PM: the father deliberately wakes him up.

14:11 PM: the father wakes him by tweaking ear.

14:13 PM: repeated.

14:15 PM: repeated.

14:17 PM: repeated.

14:19 PM: the father flicks his eyelids while asleep.

14:22 PM: the father obstructs his nasal orifices for 20 seconds before a nurse enters.

21:38 PM: the father wakes him from sleep.

21:38 PM: the father pinches his hand to wake him again.

21:39 PM: the father fingers around his nose; the infant awakes.

21:41 PM: the father places his hand over the mouth; the infant struggles for 25 seconds. The father hears a noise outside and stops.

Day 3

Time, 21:51 PM: the father puts his finger into the infant's throat.

21:53 PM: as above; the infant gags and cries, and the mother appears.

22:29 PM: the father pinches his hands. Infant wakes from sleep, cries, and then sobs. The father tells the mother who comes in that the infant had "just woke up crying."

Day 6

Time, 21:16 PM: the father digs his nail into the infant's palm repeatedly. The infant cries.

21:20 PM: the father pinches his left hand.

21:38 PM: the infant is asleep. The father shouts "wakey, wakey," and the infant wakes up.

21:38 PM: the father pinches his hand.

21:39 PM: the father fingers around the infant's nose; the infant cries.

21:41 PM: the father suffocates the infant by placing his right hand over the nose and mouth and forcing the back of the infant's head into his left hand. The infant struggles for 25 seconds before a noise outside the room causes the father to remove his hand. The infant takes a gasp of air and starts crying.

Case 24, 3-Month-Old Girl

Day 1

Time, 12:44 PM: CVS began.

14:02 PM: the mother slaps the infant's head.

14:03 PM: repeated.

14:09 PM: repeated.

14:53 PM: the mother tears up the nursing record and throws it out of the window.

14:58 PM: the mother swears at the infant, accusing her of being

responsible for them having to remain in hospital. There is growing anger, with the mother repeatedly ordering the infant to kiss her. The interaction is as follows:

- "Give me a kiss you, little sod, give me a kiss." Kiss! Kiss! Kiss! Kiss!
- "Kiss mummy mummy." (The mother gives the child a kiss.)
- "More, more, more." (Stimulates vomiting or spitting.)
- "Come on, come on. Mummy, mummy, mummy, mummy!" (Bounces roughly.)
- "I'm sick of it, sick of it, bloody sick of it. All the bloody time, mummy, mummy, mummy."
- "Stinking mummy, mummy, mummy." (Bounces roughly on knee.)
- "Give me a kiss, give me a kiss" (Shakes roughly.)
- (Indecipherable; raising volume, single screamed words.)
- (Mother then calms slightly, cuddles child briefly.)
- "Rock a bye, rock, rock a bye." (Holds child up by her arms.)
- (Indecipherable)
- "Dance, dance, dance." (Shakes, lifts by arms, sings.)

Time, 15:01 PM: the mother roughly patted the child's face 14 times and then presses her hand forcibly against the child's face in an unusual way. She then started to shake the infant like a doll.

15:02 PM: the mother deliberately and forcefully bent back the infant's left arm at the elbow. The force used led to the elbow going well beyond 180 degrees. The infant started screaming. The mother pressed the nurse alarm call button. When the nurse came in, the mother stated that the child had caught her arm in one of the toys attached to the cot as she was trying to lift her. The child was examined by a doctor who was unsure as to whether there was a fracture and indicated this to the mother.

Unfortunately, the mother was then left alone for ~30 seconds, and again she forcibly bent back the child's left arm at the elbow causing her to scream. (See reference 23 for additional comments on this case.)

15:06 PM: surveillance ends, mother separated from child.

Case 34, 18-Month-Old Female Child

Day 1

Time, 12:14 PM: CVS begins.

18:08 PM: the mother is away for the night.

Day 2

10:50 AM: the mother returns.

12:20 PM: the mother tells the child that if she doesn't stop making a noise she will smack her and "I don't want to do that in the hospital."

15:18 PM: the mother smacks the child with a toy hammer.

15:26 PM: the child calls "mummy." The mother smacks her.

15:27 PM: the mother smacks her.

16:08 PM: the mother deliberately pinches the child who begins to cry and develops breath-holding. She reaches for comfort from her mother but is ignored. After 20 seconds, the mother presses an alarm to call the nurses. They don't appear. The child reaches for the mother again who draws back from her. The mother hears a nurse coming but the breath-holding has stopped; she slaps the child hard on the leg. The child cries and the nurse enters the room. The mother appears to be comforting the child. The mother tells the nurse that the child had suffered a small event.

19:51 PM: the mother says lie down and sleep, then hits her hard on the back. She then immediately strokes the child's back.

19:53 PM: the mother smacks her hard on the bottom, then on the top of leg and says "go to sleep."

20:03 PM: the child sits up. The mother smacks her and pushes her down by her head. The child cries.

20:09 PM: the mother smacks her on the leg and then pushes tissues up her nose. The child cries.

20:11 PM: the child moves. The mother hits her leg.

20:12 PM: the child talks. The mother hits her leg.

20:15 PM: the mother says "I'm going out. I don't love you any more babe."

20:16 PM: the mother leaves for the night.

Day 3

Time, 11:08 AM: the mother returns.

12:30 PM: the mother smacks her for no apparent reason. The child cries. The mother says "I don't care."

13:14 PM: the mother lies down with the child trying to get her to sleep. The child kicks her legs. The mother smacks her.

13:17 PM: the mother smacks her leg.

13:19 PM: the mother smacks her back. The child cries. She then smacks her legs and face. The child cries more.

13:24 PM: the child settles. The mother leaves.

15:05 PM: the mother returns.

15:51 PM: the mother says the child is allergic to most foods and milk.

16:02 PM: the mother kisses the child on her head, she cuddles her then smacks her hard on the back.

16:06 PM: the mother smacks her on the back.

16:16 PM: the mother pulls her roughly by one arm from the bed.

17:24 PM: The mother smacks her hard for no apparent reason.

17:27 PM: the mother smacks her hard three times. The child cries. The mother scratches the child on the leg.

17:33 PM: the mother leaves.

17:54 PM: the mother returns. The mother says she has been sick with migraine.

18:07 PM: the mother leaves for the night.

Day 4

Time, 10:40 AM; the mother returns.

11:59 AM: the mother slaps the child hard.

13:28 PM: the mother slaps the child; the child cries.

13:30 PM: the mother is softly rubbing the child's forehead. Suddenly she turns and hits her on the legs. The child cries.

13:41 PM: the mother leaves.

15:40 PM: the mother returns.

15:52 PM: the mother is throwing toy bricks into a box past the child's head. Gradually, she increases the force of throwing and then a brick hits the child on the head. The child cries out in pain and begins to hold her breath. The child reaches out to her mother who ignores her and walks to examine the monitor to see if the child's skin oxygen level is falling.

15:54 PM: the mother picks up the child roughly. She places her hand over the child's mouth for 1 to 2 seconds. She wipes her face hard with tissues. The child is trying to move away but is held tight. The mother then slaps the child hard on the face. The child cries. After 1 minute of crying, the mother cuddles the child.

16:14 PM: the child walks past her mother who deliberately trips her up with her leg and kicks her in the abdomen and back on three occasions. The child cries and reaches for her mother who initially ignores her and then, suddenly, picks her up and cuddles her.

16:41 PM: the mother changes the child's diaper. The child is passive and lies on the bed quietly for 2 minutes. She then attempts to get up. The mother takes a pillow and forces it over the child's head. The child struggles to breathe. After 8 seconds, the mother removes the pillow but then replaces it for 3 seconds and then lifts the child roughly by the arm. A nurse enters the room after being alerted by the CVS observers.

CASE HISTORIES

Case 22

This boy was 6 weeks old when he presented with three unexplained cyanotic and apneic attacks. He was admitted to the hospital and suffered an ALTE while alone with his father on the ward. At the time, he was attached to a 24-hour electrocardiogram recorder that showed sinus tachycardia throughout the event.

His father was known to have Munchausen's syndrome. On various occasions, he claimed to have suffered from leukemia and epilepsy, neither of which were diagnosed. He had been admitted to the hospital after claiming to have eaten a Mars bar containing sharp objects. An x-ray showed minute pieces of metal in his stomach. He subsequently initiated legal proceedings against the store involved. When the police went to the store, they found 2-inch nails pushed through some of the Mars bars. The police received a barrage of letters from him demanding that they publicize the Mars bar problem. Six weeks later, he was admitted to the hospital with abdominal pain. An x-ray showed a nail in his

stomach. He denied swallowing this. He then left for the maternity unit to attend what he said was the imminent arrival of his infant. This child was not born until 6 weeks later. He had a criminal record for receiving stolen goods.

His stepson, born 3 years earlier, had presented with unexplained cyanotic episodes at 5 months of age. All four episodes had begun in the presence of his stepfather. During a final fatal event at home, an ambulance was called but on arrival, attendants could not resuscitate the child. Death was classified as SIDS. The stepfather issued proceedings against the ambulance authority for their alleged delay in responding to the emergency.

It was agreed in a planning meeting to implement CVS. After suffocatory and other abuse was detected, the father admitted to manslaughter of the previous stepchild and grievous bodily harm to his own son. He was admitted to a secure psychiatric unit for treatment.

Case 24²³

This infant first presented at 5 weeks of age when her mother claimed that she had found her lying blue and floppy in her cot. There were discrepancies between the medical history given to the junior doctor on admission and that given to the consultant.

After the administration of oxygen during transport to the hospital by ambulance, she was waiting with the mother to be seen in the emergency department when again she became blue and floppy. When seen by the nursing staff, she had vomited and was extremely pale. She was given intravenous 4.5% albumen and antibiotics. All cultures were negative, and she was eventually discharged home with an apnea monitor to the care of her grandmother.

Four weeks later, on the first night that she was again being cared for by her own mother, the infant suffered another cyanotic episode. When the ambulance arrived, attendants found her apneic and pale. They cleared the airway and gave her oxygen. On arrival at the hospital, she remained pale and lethargic with a pH of 7.32 and a base deficit of 4 mmol/L. She was given 4.5% albumen intravenously, and she gradually recovered. While in the hospital, the infant was nursed in an open bay and when for the first time she was left alone with her mother an additional event occurred that afternoon. Her mother disconnected the apnea monitor without telling the nursing staff. (Later she claimed the monitor was faulty.) When the nurse came into the room, the child was in the pram with the hood up. As the nurse started to leave the open bay, the mother said, "What is wrong with her." The nurse looked in the pram and found the child lying on her front. She was pale, cyanosed, and apneic. There was fresh blood trickling from both nostrils and some blood-stained secretions in her mouth. No bleeding point was found by the medical staff. The heart rate was only 50 beats per minute, and her pulse was not detectable. She was resuscitated and started breathing spontaneously after ~1 minute. An arterial blood sample showed a pH of 7.34 and a base deficit of 5.2 mmol/L.

The infant was transferred to our hospital at 3 months of age and was attached continuously to physiologic recording equipment in an attempt to identify the mechanisms for her events.¹⁴ She was nursed in an open bay area. At a time when the infant was alone with the mother, lying on the mother's lap, she was reported to have started choking and become gray. The nursing staff were called and found her pale and breathing with difficulty. She was given additional inspired oxygen, which she required for 1 hour after the event. Examination of the physiologic recording showed a pattern consistent with but not diagnostic of imposed upper airway obstruction.⁹ During the same evening, a nurse observed the mother squeezing the infant's arm while she was asleep, causing her to wake up suddenly and scream. After this observed assault, there was a transient red mark around the left wrist that the mother claimed at the time was caused by an allergy to the name band.

Two days later, a nursing support worker saw the mother apply pressure to the child's elbow; the child cried out in pain. The mother was noted to be verbally aggressive to the child and handled her roughly.

Urgent interagency planning discussions were held by telephone, and it was agreed that surveillance should be implemented. After the recorded abuse, x-rays showed transverse fractures at the upper end of both the radius and ulna, with minimal displacement. A skeletal survey showed no other bone injuries.

When confronted with the findings of the video surveillance, the mother became verbally and physically abusive and attempted to remove the infant from the ward. She was forcibly prevented from doing so by a consultant pediatrician and the nursing staff. She was subsequently arrested.

This mother was 19 years of age, and a social investigation revealed that she had a long history of severe behavioral disorders. She had attended a number of different schools and eventually ended up in a residential placement at 8 years of age. She had also been admitted to a psychiatric hospital as a child for severely disordered behavior. She was seen by a consultant psychiatrist who diagnosed a "serious personality disorder, immaturity of impulse control and difficulty tolerating help from people around her." She also presented to her family doctor with recurrent injuries to and glass in her foot. She had a conviction for theft. The mother had rejected prenatal care during the pregnancy. She had also informed her grandmother that her flat had been broken into. Subsequently, it was found that she had given the allegedly stolen property to a neighbor to sell for her.

Subsequent information from the social services department, available only after CVS and unknown to the pediatricians, revealed an anonymous complaint from someone who had seen the mother hit the child and place her hand over the child's face. Subsequent inquiries also revealed that the patient had a 17-month-old sister who had been admitted to the casualty department after an alleged ingestion of paracetamol 3 months earlier. Two months after this admission, this sibling had been noted to have marks consistent with cigarette burns on her arms and shins. The mother denied causing these and blamed a neighbor. A case conference had been held, and the names of both children were placed on the Child Protection Register.

After CVS, both children went to a foster home. The older sister was noted to have delayed development and severe temper tantrums that included screaming, biting, and scratching herself. She also poked her own eyes and pulled out her own hair in response to being corrected for minor misbehavior. She also banged her head under such circumstances. She was clinging with her foster mother and was prescribed trimeprazine to control frequent nightmares. All symptoms gradually improved during foster care. Both children were eventually adopted.

Case 34

This infant presented at 3 days of age with an episode while breastfeeding during which she was reported to have become pale gray, floppy, unresponsive, and apneic. Her mother reported that she had performed mouth-to-mouth resuscitation and cardiac massage for 3 minutes before the child recovered. On arrival at the emergency department, she required additional inspired oxygen. An arterial blood gas analysis showed a base deficit of 9 mmol/L. She was treated with intravenous antibiotics, but no responsible pathogen was identified. A multichannel physiologic recording showed no baseline abnormalities of oxygenation, heart rate, or breathing and no additional events occurred during recording. She was discharged home on a transcutaneous oxygen monitor.

At 3 months of age, the child was readmitted with a history of projectile vomiting and abdominal distension. Her mother also reported that she had suffered diarrhea every 20 minutes. She was given clear fluids, although diarrhea did not occur in the hospital. She was discharged 2 days later. One week later, she was readmitted after an alleged cyanotic episode at home. An ambulance had been called, but on arrival, the infant appeared well. She was discharged from the hospital the next day. Two weeks later, she was readmitted because of an alleged problem with the oxygen monitor. The mother had stopped home oxygen monitoring because she was afraid that the lead from the monitor might strangle the infant. Three weeks later, she was admitted again with an upper respiratory tract infection. Two months later, she left the area.

More than 1 year later, at age 17 months, the child presented to her local hospital with episodes of apnea of up to 4 minutes and cardiac arrests of up to 2 minutes according to her mother. After admission, some mild cyanotic breath-holding episodes were observed. When reporting these alleged episodes of major collapse, the mother spoke in a calm, almost nonchalant manner. While reassuring her that the episodes were harmless breath-holding attacks, the mother assaulted the pediatrician by punching him in

the chest. A multiagency planning meeting was held, and CVS was implemented.

After confirmation of suffocation, the child entered foster care. Initially she suffered multiple short cyanotic breath-holding episodes; however, within 2 weeks, these had ceased. Her foster mother reported that she disliked having her face washed.

The family doctor's medical records of the mother revealed multiple attendances and multiple investigations for unexplained symptoms. These symptoms included abdominal pain, episodes of tongue curling, dizziness and difficulty walking, asthma, allergies to all known antibiotics, recurrent injuries to the wrist, and multiple accidents. There was also a history of an alleged but unproven malrotation of the bowel.

The mother's social history revealed that she had been adopted first by her grandmother and then by a cousin. At 7 years, she was allegedly raped by her foster brother. As a teenager, she alleged that her adoptive father had abused her both physically and sexually, including stabbing her with a knife. She entered foster care. Her teachers described her as having been extremely disruptive. She manifested poor concentration and was withdrawn and given to angry outbursts. During adolescence, she overdosed on drugs two times. She repeatedly presented her pet cats to the veterinary surgeon.

Case 35

This previously healthy boy, whose weight and height were both above the 50th percentile, presented at age 2.8 years with a history of three afebrile convulsions in the preceding 2 days. His mother had suffered from epilepsy in childhood, but it was poorly controlled. The father also had convulsions since early childhood, but these were well controlled. A maternal aunt, 10 years of age, was being treated for epilepsy.

After admission no seizures were observed, but an electroencephalogram (EEG) suggested a possible focus of abnormal discharges and he was treated with carbamazepine and discharged 4 days later. He was readmitted the next day because of 13 convulsions reported to have occurred at home. His mother said that he had manifested convulsions at the nursery, although this was denied by the nursery staff. His family doctor increased the dose of carbamazepine. During an additional 4 days on the ward, no seizures were witnessed by nursing or medical staff. He was sent home.

Shortly afterward, the paternal grandmother called to find out why the child had been discharged when he was still vomiting and had not passed urine, concerns which had been raised with her by the mother. The grandmother had also been told that additional convulsions had occurred at home, although she had not witnessed them herself. She was told by the mother that during one convulsion, the patient had fallen head first into the toilet.

He was readmitted the next day because his mother reported additional convulsions, one of which had resulted in a fall down the stairs. On admission, he was sleepy and was noted to have a scab around the outside of his right nostril that he said his mother had caused. He also had a limp; however, a skeletal survey showed no abnormalities. During this admission, additional convulsions were reported by his mother, but none of these were witnessed by the nursing staff. Despite being requested to report the onset of convulsions, his mother reported them 10 to 15 minutes after they had allegedly ended.

For 5 days after this admission, the boy was intermittently unsteady and sleepy. A carbamazepine level was 10.5 ng/L (normal range, 6 to 12 ng/L), which was surprising because he was not receiving a high dose of drug (6 mg/kg/day). At this point, his mother reported that he had not passed urine and was not eating, but these symptoms were not verified by the nursing staff.

On one occasion, at 2150 hours (9:50 PM), the child and mother were alone in a four-bed bay. The emergency bell was sounded, and the nurses ran in to find that the child had vomited. His mother said that he had suffered a fit. She was standing behind him, not touching him, and his left leg appeared to be twitching. When he was moved by the nurses, he shouted "that was naughty, that was naughty." His mother had vomit on her hands, and the nursing staff were unsure as to how this had happened because the mother had not handled the child in their presence. Later that night, the child seemed disturbed during sleep, shouting "no" and "stop it mummy" for no obvious reason.

There were several episodes when he suddenly became very upset or cried out when alone with his mother. The child also reported "Mummy hurt my leg" and "Mummy hurt me here" pointing to his shoulder.

On one occasion when the mother and child were alone in the ward bathroom, the emergency bell sounded and nurses arrived to find the mother looking distressed, saying that the child had been twitching and gasping and had fallen backwards into the bath. The child was sitting in the bath crying. When the nurses began to dry him, the mother came over and touched him. He pulled away and said "No mummy no," and clung to the nursing staff and did not want to go to his mother. The nursing staff noted transient red finger marks on his right upper arm and one red mark in the center of his back. His mother then forcibly removed the child from the nurse while he was crying and protesting. He continued to cry for 5 minutes before falling asleep.

Two days later, the child was reported by his mother to have passed only 50 mL of urine in the past 24 hours. He had been sleepy and had a reduced fluid intake, but blood tests showed normal urea and electrolytes. An additional EEG was performed that showed slow wave activity suggestive of either drug toxicity or hypoxic cerebral injury.

At a social services strategy discussion requested by medical staff, nursing staff stated that they felt this child "was probably being subjected to subtle and sinister abuse." It was agreed that CVS should be implemented. At 1545 hours (3:45 PM) on the first day of surveillance, the mother was seen to place some pills into the child's milk. She then tried to encourage him to drink and asked the nursing staff to assist. The child spilled some of the drink, which was mopped up with a tissue. The nurse noticed a white granular substance on it, and this was given to the police for analysis. Approximately 1 hour after being given the drink, the child fell asleep.

At 18:53 hours (6:53 PM), the child was lying prone on his bed asleep with his face to the right. His mother came to the bed and occluded his nose for 3 seconds while holding his back. He stirred and was upset. At 21:10 (9:10 PM) hours he was asleep again, and his mother pinched his nose and covered his mouth with one hand while holding his head down with her other hand. The child struggled until his mother released her grip.

After her subsequent arrest, the mother admitted to administering some of her own carbamazepine to the child. The mother denied suffocating him, but said that she had seen his leg twitch and considered that he was having a seizure. She stated that her actions observed under surveillance were designed to prevent him from swallowing his tongue.

At a subsequent case conference, the HV reported that during home visits the child had been reluctant to go to his mother. The mother admitted that she had also placed her own tablets into the child's drink 3 days before CVS began.

Subsequently, the mother claimed that her abusive actions were attributable to a combination of her own epilepsy and the medication she was taking to control it. One week after the case conference, the mother collapsed. She was admitted as an emergency patient and found to have a toxic level of antiepileptic drugs in her blood. She blamed the doctors for confusing her with the doses of drug she was supposed to take. She also claimed to have a visual field defect, which was inconsistent on testing.

In foster care, the child's behavior was extremely aggressive. He pinned his younger brother to the floor by lying on top of him. He had nightmares and stated frequently that his mother had hurt him.

A psychological assessment of the mother showed that she had a borderline IQ. She continued to insist that her son had suffered seizures attributable to epilepsy. A forensic psychiatric report on the mother failed to find evidence that she had acted in postictal confusion or that her behavior was consistent with a toxic confusional state resulting from drug treatment. The psychiatrist viewed the CVS recording with the mother, who agreed that she had suffocated her child but said she could not remember doing it.

A review of the family history revealed that the mother's 10-year-old sister was said to have epileptic seizures reported by her mother. An EEG had shown some possible abnormal activity on the left brain. She had never lost consciousness but was treated with carbamazepine. After the case conference on the index patient, she was not brought to any subsequent outpatient appointments.

The patient's brother, who was just over 1 year old at the time

of these events, had been admitted with gastroenteritis on a number of occasions. During one of these admissions, at 3 months of age, the nursing staff were unable to verify the mother's account that the child was having large vomits. An examination of the infant's clothing suggested that it had been soaked in an odorless, clear liquid such as water; there was no suggestion of vomit.

The father, having seen the covert video recording, stated that he could not understand how his wife could "switch from an abusive to a loving mother."

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