This article, the first in a series, was published in partnership with the Houston Chronicle. (https://www.houstonchronicle.com/news/investigations/article/A-Devastating-Diagnosis-14419072.php)

HOUSTON – A panicked voice jolted Ann Marie Timmerman awake around 3 a.m.

"There's something wrong with Tristan."

Her husband, Tim, stood over her, wide-eyed, holding their 4-month-old boy. Tim had been sitting up with the baby in another room, letting his nursing wife catch up on sleep. Now the infant was limp in his arms, pupils rolling back in his head.

My baby's dying, Ann Marie thought as she jumped out of bed that night more than three years ago. No time for an ambulance.

She yanked on a pair of pants, grabbed the child and got in her car while Tim stayed behind with their two older boys. As Ann Marie sped down the highway – one hand on the wheel, the other pressing her baby to her chest – she prayed out loud: "God, please don't take him from me."

Tristan had been their "miracle baby," born healthy after doctors diagnosed her with an autoimmune disorder and warned she might not be able to have a third child.

Now, as she ran barefoot into an emergency room in Katy, Texas, she was afraid she might lose him.

She was right, it would turn out. But not in the way she feared.

Do No Harm

An investigation examining the work of child abuse pediatricians



Part 1: A devastating diagnosis



A sick baby. A worried mom. Diagnosis: Abuse?



Part 3: Burned by 'bad science'

A different kind of doctor

A day later, after Tristan was taken by ambulance 30 minutes away to Children's Memorial Hermann hospital in Houston, a string of specialists cycled through his room. A radiologist scanned his brain. Another doctor examined his eyes.

Then a neurosurgeon delivered good news: Tristan had a tiny brain bleed, Dr. David Sandberg said, possibly the consequence of a head injury that babies sometimes suffer during childbirth. It probably would resolve in a few days, he explained, and Tristan was safe to go home.

Ann Marie cried with relief as she and Tim awaited discharge papers.

But soon another doctor entered Tristan's room and told the Timmermans she had reached a far different conclusion. Dr. Rebecca Girardet said it appeared that Tristan also had suffered bleeding in his eyes, and because of that, she wanted a more detailed brain scan.

When Ann Marie protested, the doctor explained herself.

"I believe that he may have been shaken," Girardet said, according to her notes, shocking the Timmermans into silence.



Tristan Timmerman after being rushed to the hospital in May 2016.

They didn't know it at the time, but Girardet is not a typical pediatrician. She's a leading figure in a relatively small but growing subspecialty of doctors who practice a rare blend of medicine and forensics, relying on medical imaging, witness interviews and past experience to diagnose not only a child's condition, but also what caused it.

Unbeknownst to many parents who encounter them, these pediatricians, now stationed at virtually every major children's hospital in the country, work closely with child welfare agencies and law enforcement, providing expert reports and court testimony in thousands of cases a year and helping to shield untold numbers of abused children from additional harm.

But in their zeal to protect children, some child abuse pediatricians also have implicated parents who appear to have credible claims of innocence, leading to traumatic family separations and questionable criminal charges, an investigation by NBC News and the Houston Chronicle has found.

Even critics acknowledge that the doctors' conclusions are likely correct most of the time, particularly in cases where children have suffered extensive unexplained injuries. But when the evidence is less clear, a diagnosis of child abuse can devastate families, often with long-term consequences.

Because records of child welfare investigations are confidential, there is no way of knowing how often parents lose custody, temporarily or otherwise, based on the opinion of a child abuse doctor.

Reporters for this series spent nine months examining more than 40 such cases in Texas, a state that provides \$5 million in grants each year – including \$2.5 million from the agency that oversees Child Protective Services – to support the work of these physicians, deputizing them to review cases on behalf of child welfare investigators. Reporters scrutinized thousands of pages of court transcripts, government contracts and medical records. They spoke with more than 75 attorneys and doctors, and interviewed two dozen current and former Child Protective Services employees and union officials.

The reporting reveals a legal and medical system that sometimes struggles to differentiate accidental injuries from abuse, particularly in cases involving children too young to describe what happened to them. Physicians intent on protecting the most vulnerable in some instances have overstated the reliability of their findings, using terms such as "100 percent" and "certain" to describe conclusions that usually cannot be proven with absolute confidence. Child welfare workers, overworked and untrained in complex medical issues, are not always sure how to proceed when the primary evidence against a caregiver comes in the form of a doctor's note.

Under this system, children are sometimes taken from seemingly caring parents, while others are left in situations that, in rare cases, turn out to be deadly.

Share your story: Tell us your experience with doctors and the child welfare system (https://www.nbcnews.com/news/us-news/share-your-story-tell-us-your-experience-doctorschild-welfare-n1055881)

Parents managed to regain custody in most of the cases reviewed by reporters, in some instances after additional medical findings or reports from outside experts raised doubts about the initial abuse determination. Nevertheless, some parents lost jobs or faced financial ruin as the result of their fights with Child Protective Services, and a few children emerged from foster care suffering from depression or other health issues. In a few instances, caregivers were charged criminally or had their parental rights permanently terminated, despite questions about the doctors' findings in their cases.

Among the cases examined by NBC News and the Chronicle:

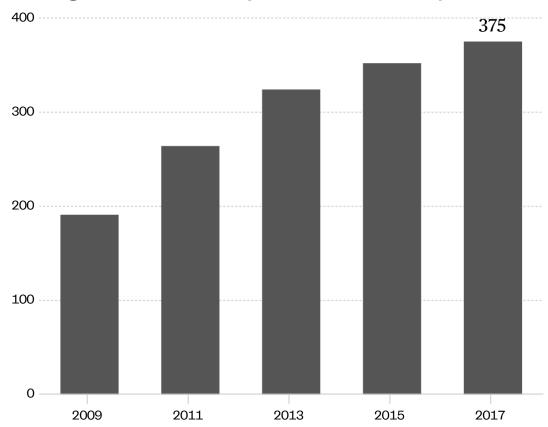
- Three-month-old Zoey Grant's parents didn't know what caused the bruise on her bottom, and since it wasn't an injury the baby could sustain on her own, a state-backed child abuse pediatrician in Dallas reported the mark as abuse – failing to mention that it was the parents who first noticed the injury and brought the child in for an evaluation, worried she may have been hurt at day care. Armed with the doctor's report, Child Protective Services workers showed up with emergency removal orders (https://www.fox4news.com/news/family-says-cpsmishandled-child-abuse-investigation) and placed Zoey and an older sibling in foster care.
- Short drops don't usually cause serious head injuries, so when 5-month-old Mason Bright (https://www.houstonchronicle.com/news/houston-texas/houston/article/Texas-judge-ordersrare-127-000-sanction-against-13376803.php) arrived at a Houston emergency room with two skull fractures and subdural bleeding, a doctor in training to become a child abuse pediatrician concluded that the injuries would not have resulted from an accidental fall in the driveway, as his mother insisted. A later test revealed that the boy may have suffered from a clotting disorder that helped explain the excessive bleeding, and another medical expert pointed out that it's possible to suffer multiple skull fractures from a single short fall. But that didn't stop Child Protective Services from taking the boy and his older sister.
- In another case, grandparents in East Texas lost custody of their grandchildren and were sentenced to 25 years in prison based largely on the opinion of a child abuse pediatrician who told authorities that, based on the pattern of burns on a child who'd been scalded in a

bathtub, he could determine with certainty – without even knowing the water temperature or other variables - whether the injuries were accidental or inflicted. The Texas Court of Criminal Appeals overturned the couple's convictions

(https://law.justia.com/cases/texas/court-of-criminal-appeals/2016/pd-1429-14.html) in 2016 after concluding that the doctor "did not base his opinion on the particular facts" of the case.

Hospitals have long employed doctors with a special interest in child abuse, but it wasn't until a decade ago that the American Board of Pediatrics certified a new medical subspecialty (https://pediatrics.aappublications.org/content/128/1/156) dedicated to protecting children. The goal was to standardize the process for assessing suspicious injuries, reducing the risk of both missing abuse and overreporting it, the doctors say. Today, about 375 child abuse pediatricians practice throughout the U.S., including about 20 in Texas.

Running total of child abuse pediatricians nationally



Source: ABP Certification Management System

By law, all doctors are required to report to authorities when they suspect a child may have been abused. Child abuse pediatricians go further: They then investigate and work to confirm whether abuse has occurred.

Officially, the doctors have no authority to take children from parents, but in practice, their reports carry extraordinary weight.

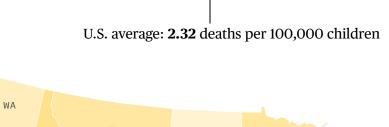
Current and former Child Protective Services employees in Texas told reporters that opinions from child abuse pediatricians sometimes drive their investigations. Three former supervisors said they at times doubted the conclusions of agency-funded physicians but, facing pressure to close cases quickly and avoid the potential liability of dismissing a doctor's warning, two of them said they sought to remove children – or knew of others who did – despite lingering doubts.

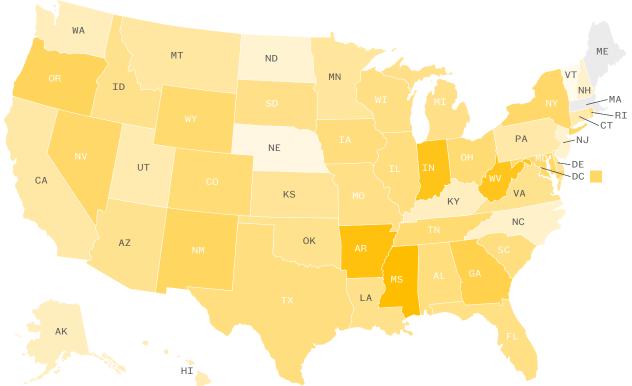
In interviews, child abuse pediatricians acknowledged that a mistaken diagnosis can result in a child being taken from caring parents. But overlooking warning signs, they said, could lead to an even worse outcome.

Nationally, nearly 1,700 children died of abuse or neglect in 2017, according to the Children's Bureau of the U.S. Department of Health and Human Services. Texas led the country with 186 deaths that year, at a rate slightly higher than the national average. In total, about 10,000 Texas children are identified as victims of physical abuse or medical neglect annually.

The rate of children killed as the result of abuse

An estimated 1,688 children died from abuse and neglect nationally in fiscal year 2017. The rate of children killed in Texas was slightly higher than the national average.





Note: Maine and Massachusetts did not report data.

Source: U.S. Department of Health and Human Services, Child Maltreatment, 2017

Dr. Christopher Greeley, a professor of pediatrics at Baylor College of Medicine in Houston, leads a team of six child abuse pediatricians at Texas Children's Hospital, one of the largest groups of its kind in the country. In an interview, he said he and his colleagues work hard to rule out other explanations before drawing their conclusions.

"We don't say, 'Eh, take the kid away,' in a sort of flippant manner," Greeley said. "If we see the kid's been abused, then we say the kid's been abused, recognizing the impact it has on the family."

But Dr. Eli Newberger, who founded the child protection team at Boston Children's Hospital in 1970 and helped lay the groundwork for the modern field of child abuse pediatrics, said he has noticed a troubling trend in recent years.

Although he considers many child abuse pediatricians "heroic" because of their willingness to advocate on behalf of vulnerable children, Newberger, a former Harvard Medical School professor, said he's encountered some who are "too quick to label a child's injuries abusive," blinding them in some instances to more benign explanations.

"That happens far too often," said Newberger, who has reviewed dozens of cases and testified on behalf of some accused parents since retiring two decades ago. "It's important that physicians approach these cases with humility. Otherwise they risk making a mistake."

'Please don't take him'

The Timmermans were stunned that day in May 2016 by Girardet's suggestion that Tristan had been abused. Ann Marie recalled turning to her husband, incredulous: "You didn't shake him, did you?"

Tim, speechless, mustered only a shrug before later denying he had intentionally harmed the child. He'd fallen asleep holding the baby, Tim explained; after he awoke with a start, he found Tristan in bed next to him, seemingly in distress.

"Tristan cannot be allowed to go home with a caregiver who may have shaken him," Girardet wrote in the baby's medical record minutes after the encounter.

For the Timmermans, the exchange marked the informal start of a seven-month battle to save their family. Within hours, before any additional medical testing had been completed, a state investigator for Child Protective Services entered the hospital room and informed them that the agency was taking emergency custody of Tristan.

Ann Marie's father recorded their conversation with the investigator and shared the audio with reporters.

"They're saying that it's shaken baby syndrome," the investigator said, adding later, "It's not really all my call."

"Please don't remove my baby, please," Ann Marie said, sobbing. "Please don't take him from me."

Listen: The moment Ann Marie learns CPS is removing Tristan



They pleaded with the investigator to talk to Sandberg, the neurosurgeon who seemed to believe Tristan was fine. The investigator said nobody at the hospital had mentioned the doctor to her, and there's no indication in hundreds of pages of records released to the Timmermans that the agency ever contacted him.

Girardet and Sandberg, both professors at UTHealth's McGovern Medical School in Houston, declined through a spokeswoman to be interviewed. The Timmermans signed a privacy waiver freeing doctors to comment on their case, but they declined to do so.

The medical school's spokeswoman instead directed reporters to public remarks Girardet made in March while testifying before a committee of the Texas House of Representatives about a bill that would have required Child Protective Services to seek a second doctor's opinion before removing children in some instances.

The second second

Girardet cited a 2016 study she conducted showing that state-funded child abuse pediatricians in Texas ruled out or failed to confirm abuse in nearly half of the cases they examined on behalf of protective services from mid-2012 to mid-2014.

"This is because child abuse pediatricians are not only experts in diagnosing child maltreatment," Girardet said at the hearing, "we're also experts in diagnosing conditions that can mimic child maltreatment."

Dr. Jamie McCarthy, an executive vice president at Memorial Hermann Health System and an emergency room physician, said these cases are complicated, but child abuse pediatricians are specially trained to sort them out.

Rather than rely on an orthopedist to scrutinize suspicious fractures, a neurologist to scrutinize suspicious head injuries or a burn specialist to scrutinize suspicious scalding injuries, child abuse pediatricians say they examine a complete picture of a child's condition to draw their conclusions.

The child protection team at Memorial Hermann does its best to provide authorities with a thorough and accurate assessment in each case, McCarthy said, with the goal of saving lives.

"We view it as critical that we protect children and the vulnerable," he said, emphasizing that he is not directly involved in the hospital's child protection efforts and could not discuss specific cases.

In a statement to NBC News and the Chronicle, Dr. David Callender, who took over as president and CEO of Memorial Hermann

(https://communityimpact.com/houston/healthcare/2019/07/18/just-announced-memorialhermann-health-system-appoints-new-president-ceo/) earlier this month, said doctors have "a legal and moral obligation" to report to authorities when they suspect child abuse. But he acknowledged that when the system fails, "the consequences are devastating to children and families alike."

"As medical providers, we've taken an oath to do no harm," Callender said, "and we are always looking for ways to continue delivering upon our promise to always do what's right for patients and their families."

A reasonable doubt

Two weeks after Child Protective Services took custody of Tristan and placed him in the care of his maternal grandparents, the retired couple brought the baby to an outpatient clinic overseen by Girardet.

As is often the case, the medical team that reported its suspicion of abuse had been tasked with running thousands of dollars worth of additional tests – often paid for by the state's Medicaid program – to rule out underlying medical conditions and detect other signs of trauma.

Tristan's grandparents, Rodney and Laura Vickers, carried a diaper bag and a cooler of chilled breast milk to the clinic, at the sprawling Texas Medical Center in Houston. The baby cried for much of the three-hour visit, which included blood draws and full-body X-rays. Toward the end of the appointment, a social worker stopped by to ask the grandparents how things were going at home.

Speaking over Tristan's screams, Rodney Vickers explained that they were doing their best to care for the baby, but it wasn't easy, according to a recording of the encounter. Ann Marie and Tim had been barred from being around their child unsupervised and were not allowed to see him at all overnight, making it difficult for Ann Marie to continue breastfeeding.

"And how do we feel about the term shaken baby syndrome, in terms of what happened?" the social worker said, according to the audio recording.

"I don't think he was shaken at all," said Laura Vickers, insisting that her son-in-law, Tim, had always been a gentle caregiver.

Rodney and Laura Vickers fostered their daughter's infant son after the state of Texas accused their son-in-law of shaking him. (Elizabeth Conley / Houston Chronicle)

"We've known this young man for a long time," Rodney Vickers told the social worker, "and he's one of the finest individuals."

That, apparently, was not the answer the child abuse pediatric team was looking for.

Afterward, Girardet wrote an updated report for Child Protective Services, noting that Tristan's blood tests were negative for clotting disorders that can mimic abuse and concluding that the baby's injuries "were certainly inflicted." But the doctor offered more than just her medical opinion. She also warned that Tristan might still be in danger, even after being taken from his parents.

"Grandparents do not believe that Tristan was shaken," Girardet wrote, "which means that they will not likely be protective caregivers."

To Ann Marie, the note read like a call to place her baby in foster care, or worse, an effort to persuade her parents to turn against her husband. To some legal experts, the remark illuminates a broader concern about the dual roles of child abuse pediatricians, medical professionals who also have a hand in the child welfare system.

The Timmermans were surprised to learn from a reporter that Girardet's work is funded by the state agency that oversees Child Protective Services. According to a 2018 grant agreement with UTHealth's (https://www.documentcloud.org/documents/6414302-Texas-child-abusecontract.html) McGovern Medical School (https://www.documentcloud.org/documents/6414302-Texas-child-abuse-contract.html), Girardet spends 62 percent of her time working on matters related to her medical school's contract with the Texas Department of Family and Protective Services, which funds a commensurate share of her \$181,500 university salary (https://salaries.texastribune.org/the-university-of-texas-health-science-center-athouston/rebecca-girardet/1748016/).

The doormat at Rodney and Laura Vickers' home in Houston. (Elizabeth Conley / Houston Chronicle)

Salaries and benefits packages of several other Texas-based child abuse pediatricians, nurses and social workers are funded through a similar arrangement, obligating the medical teams to review cases of suspected abuse on behalf of Child Protective Services through a program known as the Forensic Assessment Center Network (https://www.facntx.org/Public/Default.aspx), which Girardet leads.

Child abuse pediatric teams across the country often rely on grants to defray the costs of a medical subspecialty that generally loses money for hospitals (https://cacnc.org/wpcontent/uploads/2016/06/Childrens-Hospitals-role-in-child-maltreatment.pdf). Some programs receive funding from state criminal justice agencies (https://www.dailypress.com/news/crime/dpnws-chkd-police-prosecutors-20180514-story.html), as in Virginia, or from public health departments, as in Michigan.

Girardet has defended the Texas arrangement. When a defense lawyer asked about one of the state grants in 2017, for example, she argued the university would continue paying her if the money went away. And while testifying before the Texas Legislature in March, she said the financial support does not affect her decision making.

"I'm paid by the University of Texas," Girardet said. "My salary doesn't change one iota whether I say the child was abused or not."

But in the same way that crime labs are susceptible to bias when they are directly overseen by law enforcement agencies (https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf), physicians risk losing credibility when they become too closely aligned with Child Protective Services, said Keith Findley, a professor at the University of Wisconsin Law School who co-founded the Wisconsin Innocence Project and who has defended caregivers accused of shaking infants.

"When you have a subjective analysis like you do from the doctors in these child abuse cases, you have to go the extra mile to ensure that the person conducting the analysis is free of any influence that could lead to cognitive bias, overt or otherwise," Findley said. "It seems like they've created the opposite in Texas."

The problem, according to Diane Redleaf, a family law attorney in Illinois who wrote a paper on the ethics of expert physician testimony in child abuse cases (https://www.familydefensecenter.net/wp-content/uploads/2016/04/Medical-Ethics-Concerns-in-Physical-Child-Abuse-Investigations-corrected-reposted.pdf), is that some physicians may come to think of themselves as "part of the team" with child welfare workers.

As a result, Redleaf said, sometimes the doctors' testimony and commentary "crosses the line between medical opinion and advocacy."

A Chronicle and NBC News review of dozens of court transcripts revealed several examples of child abuse pediatricians presenting their opinions with absolute certainty while at other times sharing viewpoints that seemed to go beyond their role as medical experts. In some instances, they offered advice on what the state should do with children who they believed had been abused.

A doctor told a judge in 2015 that she didn't believe Child Protective Services should return a child to parents she suspected of medical neglect, even under a safety plan, saying, "I don't trust them to do what they say they'll do." In a 2017 case, a child abuse pediatrician recommended in

court that a mother she suspected of abuse be allowed only supervised visits with her daughter – if at all.

Another doctor, in 2011, said "yes" when asked in court whether she considered research suggesting that most rib fractures in young children are inflicted to be "proof beyond a reasonable doubt" that a specific infant with such injuries had been abused.

And during a criminal trial in March, Dr. Marcella Donaruma, a child abuse pediatrician at Texas Children's Hospital, repeatedly testified that she was "100 percent certain" that bleeding and swelling in a baby's head – as well as other injuries, including bruises and a healing femur fracture – were the result of abuse.

"She's an abused child, and now she's safe," Donaruma testified at one point, seeming to endorse the earlier decision by the state to place the infant in foster care.

A neurologist who testified on behalf of the defense said he reached a different conclusion about the child's head injuries after reviewing medical records, and the child's father was found not guilty.

Few medical opinions can be 100 percent certain, experts say, particularly in cases where doctors are being asked to diagnose not just a child's condition but also what caused it. There is no lab test to confirm that a baby has been intentionally shaken or prove that a child's scalding burns were inflicted.

Donaruma declined to be interviewed for this story. Dr. Mark Kline, the physician in chief at Texas Children's, initially told reporters in an interview that "anybody who says 100 percent about anything is immediately suspect to me."

But after being presented with more details about the specific example, he said such statements are warranted in some instances, especially when it's clear the child has been harmed.

"When extreme indications of child abuse are present," Kline said in a statement (https://www.documentcloud.org/documents/6414304-Texas-Children-s-statement.html), "it is entirely understandable and appropriate that the physician might assert 100 percent confidence in the diagnosis."

Tristan Timmerman when he was a newborn. (Kelly Garvey)

Deference to doctors

Child Protective Services doesn't always take children from their parents when a doctor warns of abuse.

In one high-profile example in 2017, Dr. Suzanne Dakil, a child abuse pediatrician at Children's Medical Center in Dallas, alerted protective services that a 3-year-old girl, Sherin Mathews, had suffered several fractures that Dakil said were concerning. In that instance, however, Child Protective Services left the child in the care of her parents (https://www.dallasnews.com/news/crime/2017/12/01/cps-failed-sherin-mathews-commissionersays). Seven months later, the girl was found dead in a culvert, and her adoptive father was

charged with murder. He later pleaded guilty to a lesser charge (https://www.dallasnews.com/news/courts/2019/06/26/richardson-dad-who-let-3-year-old-sherinmathews-die-over-milk-gets-life-in-prison/).

Afterward, the state's child welfare agency amended its internal policy (https://www.dallasnews.com/news/child-protective-services/2018/05/16/cps-stop-investigatingsherin-mathews-parents-months-before-killed), instructing investigators to give even more weight to opinions issued by state-funded child abuse pediatricians.

Ultimately, state child welfare agencies are left with the difficult task of determining when the risk to a child's safety is significant enough to take her from her family.

A timeline of the Timmerman case

Parents accused

May 24, 2016

A child abuse pediatrician at Children's Memorial Hermann Hospital in Houston tells Ann Marie and Tim Timmerman that she believes their baby, Tristan, was shaken. In response, a Child Protective Services investigator files paperwork taking emergency custody of Tristan.

Tristan is removed

May 25, 2016

A judge approves the emergency removal, placing the baby into the care of his grandparents. The state files a suit to terminate the Timmermans' parental rights, citing its conclusion that there's "reason to believe" that Tim had abused Tristan and that Ann Marie neglected to protect him.

Tristan returns home

July 21, 2016

When a referral comes in from a hospital, a caseworker shows up to hear the family's explanation for the injury and see if it squares with what doctors see. After talking to the hospital social worker and reading medical records, caseworkers confer with supervisors before deciding how to handle the case.

It's a process designed to include input from everyone involved, but current and former Child Protective Services employees said, in the subset of cases that involve concerning medical findings, the opinions of child abuse pediatricians are paramount.

Rhonda Carson, a former protective services supervisor, said a common refrain in the agency was: "We are not doctors."

"They stop looking at anything once a doctor gives their opinion," she said.

Sherry Gomez, who oversees child welfare investigations statewide in Texas, said workers conduct thorough investigations after receiving reports from child abuse pediatricians, but added, "I think to some extent we have to rely on our experts in that field."

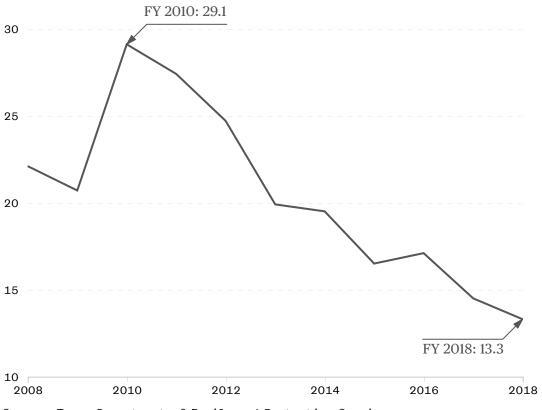
Confronted with a constant flow of new cases, workers said they have little time to scrutinize a child's complete medical records or seek out additional physician opinions. Two dozen current and former protective services employees described an overburdened agency that struggles to keep up with a constant flow of new cases.

On an average day, Child Protective Services receives reports of about 800 children who may have been abused or neglected. Each report is assigned to one of the state's 2,100 investigators. Abuse reports from hospitals make up a small fraction of the cases and are often among the most complicated.

Officials in Texas have tried to reduce the number of cases assigned to each worker since the 2016 death of a 4-year-old girl in a Dallas suburb (https://www.dallasnews.com/news/politics/2016/04/09/4-year-old-needed-dallas-cps-before-shewas-killed-but-agency-failed-at-every-turn-records-show) whose caseworker, saddled with 70 cases, never made a visit to her home. To attract and retain more workers, officials boosted salaries and reduced education requirements, resulting in a drop in average caseloads.

Texas reduces daily caseloads

The average number of open cases assigned to each child protection investigator in Texas has fallen in recent years.



Source: Texas Department of Family and Protective Services

But there's been continued pressure to move cases through the system quickly, current and former employees said, recounting direct orders to do so and threats of disciplinary action if they failed. Two provided internal emails – spanning more than a year – from supervisors repeatedly setting daily closure quotas, a practice that experts say could incentivize (https://www.miamiherald.com/news/local/community/broward/article229394934.html)haste.

"If you have 17 or above I need the following," one supervisor wrote in an email shared with reporters. "The two cases you are closing today. The two cases you are closing tomorrow."

Patrick Crimmins, an agency spokesman, said any pressure to close cases is simply the result of the constant flood of new referrals and does not mean workers are taking shortcuts.

"Of course caseworkers are expected to handle a specific caseload – that means closing cases regularly," Crimmins said. "We concede there is pressure to close cases because new ones keep coming in."

Even when protective services concludes that a child is likely safe, an opinion from a child abuse pediatrician can tip the scales against parents.

In one Houston case from 2017, a judge refused to return a boy to his mother, even though Child Protective Services had determined she posed no danger to him. The court-appointed lawyer representing the child still opposed returning the boy, citing the severity of injuries described in the doctor's report.

The judge wouldn't even consider the possibility of returning the boy, according to a transcript, saying if the child was given back and later injured, "Your name wouldn't be in the newspaper. Mine would."

Contested science

Ann Marie thinks she was across town, meeting with Tim's lawyer, the first time Tristan laughed. It was June 2016, a couple of weeks after Child Protective Services had taken custody.

The baby was with his grandmother and giggled at a goofy face she made. Ann Marie pretended to be excited when her mother shared the news that afternoon, but in truth, she was heartbroken.

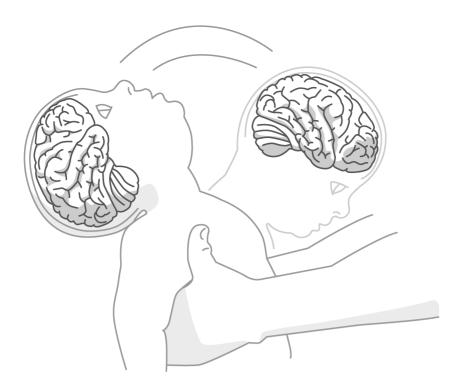
It was one in a series of special moments that she says were stolen from her that summer. A year earlier, after losing her job in the oil and gas industry, she had decided to take time off from her career to stay home with her boys.

But now she was spending much of her free time at court-ordered appointments and researching the contentious medical basis for the allegations against her and her husband.

She was surprised to learn that doubts have been raised about doctors' ability to conclusively diagnose shaken baby syndrome (https://www.ncbi.nlm.nih.gov/pubmed/28130787? dopt=Abstract), leading to overturned criminal convictions (https://www.washingtonpost.com/graphics/investigations/shaken-baby-syndrome/Theunsettled-science-of-Shaken-Baby-Syndrome.html) in recent years and prompting some physicians who once made the diagnosis to reverse themselves.

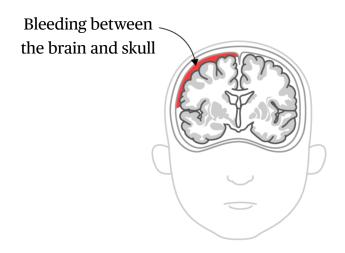
For decades, doctors have purported to be able to tell when a baby has been shaken based largely on a signature pattern of internal head injuries, including subdural bleeding, brain swelling and retinal hemorrhages. Doctors who stand by the diagnosis say that it has been validated by years of clinical observation, research and confessions from caregivers (https://link.springer.com/article/10.1007/s00247-017-3932-8).

Evidence of abuse?

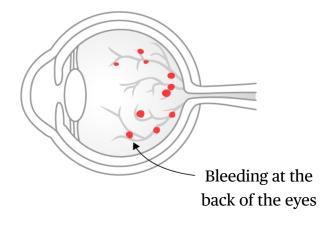


When a baby is shaken, doctors say acceleration and deceleration forces can lead to tears of bridging veins and nerve cells, triggering bleeding and swelling. Child abuse pediatricians look for these internal markers, among other signs:

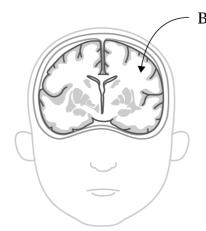
Subdural hematoma



Retinal hemorrhages



Encephalopathy



Brain swelling caused by lack of oxygen

But some biomechanical studies (https://www.ncbi.nlm.nih.gov/pubmed/15885948) have challenged the notion that a person can shake a baby with the force needed to cause the pattern of internal symptoms without also causing serious damage to an infant's neck, or other injuries. Other studies have pointed to underlying conditions, such as bleeding disorders, that could lead to similar injuries (https://www.ajronline.org/doi/full/10.2214/AJR.16.17450).

Child abuse pediatricians say they are aware of these conditions and do everything possible to rule them out before drawing their conclusions. Some of the doctors have denied there is any significant disagreement over the science

(https://www.aappublications.org/news/2017/09/15/NCEShaken091917). While testifying at a criminal trial in 2017, for example, Girardet said nobody within the medical community disputes the evidence for shaken baby syndrome. When pressed, she said that only some "unscrupulous physicians" had questioned it.

Nonetheless, some legal experts have called on the National Academy of Sciences to examine the validity of the diagnosis (https://repository.law.umich.edu/cgi/viewcontent.cgi? article=1179&context=mjlr). And in a 2016 report about problems with other types of forensic analysis, the President's Council of Advisors on Science and Technology wrote that concerns about the scientific validity of shaken baby syndrome required "urgent attention. (https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_s cience_report_final.pdf)"

But according to legal experts, skepticism about the diagnosis has not trickled down to many family law courtrooms (https://www.americanbar.org/groups/litigation/committees/childrensrights/articles/2015/litigating-shaken-baby-syndrome-allegations-child-welfare-context/), where Child Protective Services is not required to prove its case beyond a reasonable doubt, as in criminal cases, but must show only that a person of "ordinary prudence and caution (https://statutes.capitol.texas.gov/Docs/FA/htm/FA.262.htm)" would conclude that a child is likely in danger before executing an emergency removal.

Often the only doctor called to testify at hearings in family court is the physician who made the initial determination of abuse, in part because many families cannot afford to hire seasoned lawyers or outside physicians.

The Timmermans were more fortunate. The Harris County Sheriff's Office investigated but did not file criminal charges. Tristan wasn't placed in foster care, despite the doctor's warning that his grandparents might not protect him. And, perhaps most crucially, the Timmermans had

money to defend themselves.

They borrowed from family and tapped savings accounts to pay for high-powered lawyers and a medical expert to review their case. Two other physicians provided opinions at no charge.

The three outside doctors – who have each written articles challenging the shaken baby diagnosis – concluded there was ample reason to doubt that Tristan's injuries were inflicted. All three noted a drastic spike in Tristan's head size in the weeks before the incident that prompted his hospital visit. At a well-baby visit just a week earlier, the boy's primary pediatrician noted that his head circumference had jumped into the 99th percentile.

Extreme head growth during the first few months of life is evidence of benign external hydrocephalus, the medical experts wrote, a condition in which fluid accumulates between the brain and the inside of the skull, increasing pressure and, according to some case studies (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4927310/), potentially leading to the types of internal bleeding commonly associated with shaken baby syndrome. (https://pdfs.semanticscholar.org/03b7/b2526992bde7026991e64d511c3744c1c0a7.pdf)

Dr. Marvin Miller, a professor of pediatrics at Wright State University in Ohio, said it was "highly unlikely that Tristan Timmerman was the victim of child abuse as there is a plausible medical explanation for the findings."

Dr. Julie Mack, a Pennsylvania State University radiologist, said, "There is nothing about the imaging findings that are suggestive of significant or violent trauma."

And Dr. Joseph Scheller, a pediatrician and child neurologist in Baltimore, said Tristan had developed "a very small venous blood clot that caused a seizure, and he recovered from this quickly and has no residual brain injury."

Slowly, it seemed, the state's case against the Timmermans began to crumble.

In July, two months after Tristan's removal, a judge ordered Child Protective Services to return Tristan to Ann Marie after concluding it was in his best interests to be with his mother. The Timmermans were allowed to take Tristan home, but Tim still couldn't be around the baby unsupervised.

Four months later, the Timmermans petitioned the court to restore his rights, too, arguing that the state had no evidence against him either. At a hearing, Ann Marie described what she'd learned from some of the medical experts.

Girardet was not called to testify at the hearing, and a few weeks later, Child Protective Services filed a motion to drop the case. Seven months after concluding there was "reason to believe" the Timmermans had abused and neglected their child – and after the couple spent more than \$200,000 to defend themselves – the state was walking away.

A judge signed an order formally dismissing the matter.

The following spring, Child Protective Services reviewed all of the evidence in the case and agreed to reverse its original investigative findings. The staff member charged with reviewing their file said that she's seen too many cases like Tristan's, according to the Timmermans and two lawyers who were present.

When a state-backed child abuse pediatrician is involved, the worker explained, there aren't always enough checks in place to protect parents.

Tristan, now 3, fully recovered from the brain bleed and hasn't had any serious health scares since then. But now Ann Marie hesitates to take her boys to the doctor after minor injuries, fearing that another physician might see the child abuse allegation, which remains prominent in Tristan's medical chart, and call authorities to investigate.

Despite the state's move to clear his record, Tim lost his job as a landman with a Houston oil and gas company in the months after the case was closed, though he eventually found work elsewhere. He'd been afraid to tell his bosses that he was being investigated for child abuse and, as a result, he'd racked up too many unexplained absences while attending state-required appointments and court hearings.

"The idea that I would hurt my child, my baby, is ridiculous," Tim said recently. "All it took was one doctor's opinion, and it almost destroyed my family."

Tim Timmerman plays with Tristan at their home in Cinco Ranch, Texas, June 18, 2019. (Elizabeth Conley / Houston Chronicle)

CORRECTION (Sept. 19, 2019, 7:32 a.m. ET): A previous version of this article contained a photo that incorrectly identified Ann Marie Timmerman. The photo has been removed.

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