

FORENSIC SCIENCE UPDATE

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**PHONES, FORENSICS & SNITCHES:
HANDLING THE BIG ISSUES
IN AGGRAVATED CASES**

**Texas Criminal Defense Lawyers Association
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Best Lawyers in America in Appellate Law, White Collar Criminal Defense and Non-White Collar Criminal Defense, 2006-2018

Best Lawyers in America, Dallas Criminal Defense: White Collar Lawyer of the Year, 2011

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LEGAL STANDARDS FOR ADMISSIBILITY OF SCIENTIFIC EVIDENCE

T. R. Evid. 702: If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify thereto in the form of an opinion or otherwise.

***Kelly v. State*, 824 S.W.2d 568 (Tex. Crim. App. 1992)** interpreted Rule 702 and stated that in order for scientific evidence to assist the trier of fact it must be reliable and relevant.

The Criteria

In order to be admissible, expert testimony must be shown to satisfy the following three criteria:

1. The underlying scientific theory must be valid;
2. The technique applying the theory must be valid; and
3. The technique must have been properly applied on the occasion in question.

Kelly v. State, 824 S.W.2d at 573.

Factors Which Could Affect the Trial Court's Determination of Reliability

In *Kelly*, the court listed several factors intended to guide the trial court in its determination of the reliability of expert testimony. Those factors are as follows:

1. The extent to which the underlying scientific theory and technique are accepted as valid by the relevant scientific community;
2. The qualifications of the expert(s) testifying;
3. The existence of literature supporting or rejecting the underlying scientific theory and technique;
4. The potential rate of error of the technique;
5. The availability of other experts to test and evaluate the technique.

***Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 592-95 (1993)** was decided after *Kelly* and

established a virtually identical test under the Federal Rules of Evidence.

Daubert held that, “Faced with a proffer of expert scientific testimony . . . the trial judge must determine at the outset, pursuant to FRE 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue. A key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested. Another consideration is whether the theory or technique has been subjected to peer review and publication. Additionally, in the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error . . . and the existence and maintenance of standards controlling the technique’s operation. Finally, ‘general acceptance’ can yet have a bearing on the inquiry. A ‘reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community.’ Widespread acceptance can be an important factor in ruling particular evidence admissible, and ‘a known technique that has been able to attract only minimal support within the community,’ may properly be viewed with skepticism. [A] judge assessing a proffer of expert scientific testimony under FRE 702 should also be mindful of other applicable rules. . . . [FRE] 706 allows the court at its discretion to procure the assistance of an expert of its own choosing. . . . ‘Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it. Because of this risk, the judge in weighing possible prejudice against probative force under [FRE] 403 of the present rules exercises more control over experts than over lay witnesses.”

***Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999)**

The role of gate keeper regarding expert testimony under FRE 702 described in *Daubert* in relation to opinions based on science, is expressly extended to opinions based on technical and/or other specialized knowledge. The specific criteria to be used by the trial court, may, if appropriate, include those discussed in *Daubert*. The trial judge is, however, free to use any reasonable criterion which relates logically to

the nature of the basis for the offered opinion.

Expert Testimony Based on Soft Science

***Nenno v. State*, 970 S.W.2d 549, 561 (Tex. Crim. App. 1998)**

In the area of expert testimony based on “soft science” such as the social sciences or fields that are based primarily upon experience and training as opposed to scientific method, the Court of Criminal Appeals has developed a modified *Kelly* criteria by which to determine the admissibility of the testimony. The court has determined that the appropriate questions are:

1. whether the field of expertise is a legitimate one;
2. whether the subject matter of the expert’s testimony is within the scope of that field; and
3. whether the expert’s testimony properly relies upon and/or utilizes the principles involved in the field.

Additional Cases Interpreting Rule 702

***Vela v. State*, 209 S.W.3d 128, 130-34 (Tex. Crim. App. 2006)**

TRE’s 104(a), 401, 402, and 702 “set out three separate conditions regarding admissibility of expert testimony. These rules require a trial judge to make three separate inquiries, which must all be met before admitting expert testimony: (1) the witness qualifies as an expert by reason of his knowledge, skill, experience, training, or education; (2) the subject matter of the testimony is an appropriate one for expert testimony; and (3) admitting the expert testimony will actually assist the fact-finder in deciding the case. These conditions are commonly referred to as (1) qualification, (2) reliability, and (3) relevance.

An appellate court should consider three criteria when determining whether a trial court abused its discretion in evaluating a witness’s qualifications as an expert: (1) is the field of expertise complex?; (2) how conclusive is the expert’s opinion?; and (3) how central is the area of expertise to the resolution of the lawsuit?

Qualification is distinct from reliability and relevance and . . . should be evaluated independently. While qualification deals with the witness’s background and experience, reliability focuses on the subject matter of the witness’s testimony.

Tex. Rules of Evid. 705(c) governs the reliability of expert testimony . . . Reliability depends upon whether the evidence has its basis in sound scientific methodology. This demands a certain technique showing that . . . gives a trial judge the opportunity to weed out testimony pertaining to so-called junk science.

Scientific evidence must meet three criteria to be reliable: (a) the underlying scientific theory must be valid; (b) the technique applying the theory must be valid; and (c) the technique must have been properly applied on the occasion in question. A list of non-exclusive factors that could affect a trial judge’s decision on reliability includes (1) the extent to which the underlying scientific theory and technique are accepted as valid by the relevant scientific community, if such a community can be ascertained; (2) the qualifications of the experts testifying; (3) the existence of literature supporting or rejecting the underlying scientific theory and technique; (4) the potential rate of error of the technique; (5) the availability of other experts to test and evaluate the technique; (6) the clarity with which the underlying scientific theory and technique can be explained to the court; and (7) the experience and skill of the person(s) who applied the technique on the occasion in question.

And even if the traditional *Kelly* reliability factors do not perfectly apply to particular testimony, the proponent is not excused from proving its reliability. . . . The reliability inquiry is, thus, a flexible one. In some cases, the reliability of scientific knowledge will be at issue; in others, the relevant reliability concerns may focus upon personal knowledge or experience. But the proponent must establish some foundation for the reliability of an expert’s opinion. Experience alone may provide a sufficient basis for an expert’s testimony in some cases, but it cannot do so in every case.”

***Hernandez v. State*, 116 S.W.3d 26, 29 (Tex. Crim. App. 2003)**

“Once a scientific principle is generally accepted in the pertinent professional community and has been accepted in a sufficient number of trial courts through adversarial *Daubert/Kelly* hearings, subsequent courts may take judicial notice of the scientific validity (or invalidity) of that scientific theory based upon the process, materials, and evidence produced in those prior hearings.

Similarly, once some courts have, through a *Daubert/Kelly* ‘gatekeeping’ hearing, determined the scientific reliability and validity of a specific

methodology to implement or test the particular scientific theory, other courts may take judicial notice of the reliability (or unreliability) of that particular methodology.”

***Morales v. State*, 32 S.W.3d 862, 865 (Tex. Crim. App. 2000)**

“When examining the Rule 702 issue, the trial court must determine whether the expert makes an effort to tie pertinent facts of the case to the scientific principles which are the subject of his testimony. Restated, the testimony must be sufficiently tied to the facts to meet the simple requirement that it be helpful to the jury.”

***Weatherred v. State*, 15 S.W.3d 540, 542 (Tex. Crim. App. 2000)**

“Under Rule 702, the proponent of scientific evidence must show, by clear and convincing proof, that the evidence he is proffering is sufficiently relevant and reliable to assist the jury in accurately understanding other evidence or in determining a fact in issue. The reliability of ‘soft’ scientific evidence . . . may be established by showing that (1) the field of expertise involved is a legitimate one, (2) the subject matter of the expert’s testimony is within the scope of that field, and (3) the expert’s testimony properly relies upon or utilizes the principles involved in that field.”

***Gregory v. State*, 56 S.W.3d 164, 179-81 (Tex. App. - Houston [14th Dist.] 2001, pet. dism’d)**

“A medical license or degree is not the litmus test for qualification as an expert witness. *Experience* alone can provide a sufficient basis to qualify a witness as an expert.

A nurse with extensive experience in the identification and treatment of child sexual abuse victims could be *more* qualified to determine whether a child has been sexually abused than a medical doctor whose field of specialization does not touch on that subject. While a nurse is precluded from making a medical diagnosis or otherwise practicing medicine, she is not precluded from *testifying* about her mandatory duties to perform assessments, make nursing diagnoses, document a patient’s symptoms, administer medications and treatments, and implement other measures to make the patient safe. We find that [nurse] was qualified to testify as an expert under Rule 702.”

***Reynolds v. State*, 204 S.W.3d 386, 390-91**

(Tex. Crim. App. 2006)

“We hold that, when evidence of alcohol concentration as shown by the results of analysis of breath specimens taken at the request or order of a peace officer is offered in the trial of a DWI offense, (1) the underlying scientific theory has been determined by the legislature to be valid; (2) the technique applying the theory has been determined by the legislature to be valid when the specimen was taken and analyzed by individuals who are certified by, and were using methods approved by the rules of, DPS; and (3) the trial court must determine whether the technique was properly applied in accordance with the department’s rules, on the occasion in question.”

***State v. Medrano*, 127 S.W.3d 781, 787 (Tex. Crim. App. 2004)**

“Under the *Zani v. State*, 758 S.W.2d 233 (Tex. Crim. App. 1988), standard, the Court instituted procedural safeguards to protect against ‘the four-prong dangers of hypnosis; hypersuggestibility, loss of critical judgment, confabulation, and memory cementing.’ . . . The *Zani* standard permits admission of hypnotically enhanced testimony ‘if, after consideration of the totality of the circumstances, the trial court should find by clear and convincing evidence that hypnosis neither rendered the witness’s posthypnotic memory untrustworthy nor substantially impaired the ability of the opponent fairly to test the witness’s recall by cross-examination.’ *Zani* remains the standard to be applied by Texas trial courts in assessing the reliability and determining the admissibility of hypnotically enhanced testimony.”

***Mata v. State*, 46 S.W.3d 902, 916 (Tex. Crim. App. 2001)**

“We believe that the science of retrograde extrapolation can be reliable in a given case. The expert’s ability to apply the science and explain it with clarity to the court is a paramount consideration. In addition, the expert must demonstrate some understanding of the difficulties associated with a retrograde extrapolation. He must demonstrate an awareness of the subtleties of the science and the risks inherent in any extrapolation. Finally, he must be able to clearly and consistently apply the science.

***Schutz v. State*, 957 S.W.2d 52, 59 (Tex. Crim. App. 1997)**

“Expert testimony does not assist the jury if it constitutes ‘a direct opinion the truthfulness’ of a child

complainant's allegations.

***Yount v. State*, 872 S.W.2d 706, 712 (Tex. Crim. App. 1993)**

TRCE 702, now TRE 702, "does not permit an expert to give an opinion that the complainant or class of persons to which the complainant belongs is truthful."

***Barshaw v. State*, 342 S.W.3d 91 (Tex. Crim. App. 2011)**

It was an abuse of discretion for trial court to allow expert testimony that mentally retarded persons as a class are truthful.

Misapplication of Forensic Science and Wrongful Convictions

According to statistics compiled by the Innocence Project, misapplication of forensic science is the second most common contributing factor to wrongful convictions having been found in 45% of DNA exoneration cases. Studies have shown the following problems in these cases:

- Unreliable or invalid forensic disciplines
- Insufficient validation of forensic methods
- Misleading testimony from state's witnesses
- Mistakes by forensic practitioners
- Misconduct by forensic practitioners

According to the Innocence Project, the first major scientific institution to investigate this problem across the board was the National Academy of Sciences (NAS) in its report, *Strengthening Forensic Science in the United States: A Path Forward* (<https://www.ncjrs.gov/pdffile1/nij/grants/228091.pdf>), released in 2009. This report noted that "imprecise or exaggerated expert testimony has sometimes contributed to the admission of erroneous or misleading evidence." It also found that some forensic techniques, particularly those that deal with comparing patterns or features (such as tire tread impressions, bite marks, fiber, or hair), have not been subjected to sufficient scientific evaluation, and noted that the scientific basis for arson investigations should be strengthened.

The same concerns were reiterated and expanded upon in the 2016 report, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods* (<https://www.innocenceproject.org/wp-content/uploads/2017/03/PCAST-2017-update.pdf>), by the President's Council of Advisors on Science and

Technology (PCAST). This report examined the research underlying specific forensic feature comparison disciplines, evaluated their accuracy and reliability, and made recommendations to various federal agencies to strengthen these disciplines. Among the recommendations was the need for better resources to support judicial training given the changing landscape in the evaluation of forensic evidence and state of validation in various forensic techniques.

In *Invalid Forensic Science Testimony and Wrongful Convictions* by Brandon L. Garrett and Peter J. Neufeld, published in the March 2009 Virginia Law Review, the following was stated:

This is the first study to explore the forensic science testimony by prosecution experts in the trials of innocent persons, all convicted of serious crimes, who were later exonerated by post-conviction DNA testing. Trial transcripts were sought for all 156 exonerees identified as having trial testimony by forensic analysts, of which 137 were located and reviewed. These trials most commonly included testimony concerning serological analysis and microscopic hair comparison, but some included bite mark, shoe print, soil, fiber, and fingerprint comparisons, and several included DNA testing. This study found that in the bulk of these trials of innocent defendants- 82 cases or 60%- forensic analysts called by the prosecution provided invalid testimony at trial - that is, testimony with conclusions misstating empirical data or wholly unsupported by empirical data. This was not the testimony of a mere handful of analysts: this set of trials included invalid testimony by 72 forensic analysts called by the prosecution and employed by 52 laboratories, practices, or hospitals from 25 states. Unfortunately, the adversarial process largely failed to police this invalid testimony. Defense counsel rarely cross-examined analysts concerning invalid testimony and rarely obtained experts of their own. In the few cases in which invalid forensic science was challenged, judges seldom provided relief. This evidence supports

efforts to create scientific oversight mechanisms for reviewing forensic testimony and to develop clear scientific standards for written reports and testimony. The scientific community can through an official government entity promulgate standards to ensure the valid presentation of forensic science in criminal cases and thus the integrity and fairness of the criminal process.

Recent Cases

Expert Testimony on Reliability of Eyewitness Identification Procedures

Tillman v. State, 354 S.W.3d 425 (Tex. Crim. App. 2011)

Facts: Tillman convicted of capital murder based on eyewitness testimony. Tillman offered testimony from Dr. Roy Malpass as an expert on eyewitness identifications. Malpass testified that he was professor of psychology at University of Texas, El Paso, has researched eyewitness related issues since 1969 and has conducted a number of experimental studies in the area. He also leads the Eyewitness Identification and Research Laboratory at the University.

Malpass' proposed testimony was to the general suggestiveness of the identification procedure used.

The trial court excluded Malpass' testimony.

Holding: Admission of this testimony is governed by Rule 702, T. R. Evid. Proponent of the testimony must demonstrate that the testimony is sufficiently reliable and relevant to help the jury in reaching accurate results. The proponent must prove two prongs, (1) the testimony is based on a reliable scientific foundation and (2) it is relevant to the issues in the case.

The focus of the reliability analysis is whether the evidence has its basis in sound scientific methodology, such that junk science is weeded out. Since psychology is a soft science, in order to establish reliability, the proponent must establish that (1) the field of expertise involved is a legitimate one, (2) the subject matter of the expert's testimony is within the scope of that field, and (3) the expert's testimony properly relies upon the principles involved in that field.

The court held that psychology is a legitimate field of study and the reliability of eyewitness identification is a legitimate subject within the area of psychology.

Malpass' testimony properly relied upon and utilized the principles involved in the relevant field of psychology. Malpass' testimony was also relevant because he sufficiently tied the pertinent facts of the case to the scientific principles which were the subject of his testimony. *See also Jordan v. State*, 928 S.W.2d 550 (Tex. Crim. App. 1996) (finding expert testimony on the reliability of eyewitness identification admissible).

Thus, the testimony was admissible.

Perry v. New Hampshire, 132 S.Ct. 716 (2011)

Facts: Police received a call reporting that an African-American male was trying to break into cars parked in the lot of the caller's apartment building. When an officer responding to the call asked eyewitness to describe the man, witness pointed to her kitchen window and said the man she saw breaking into the car was standing in the parking lot, next to a police officer. Perry's arrest followed this identification.

Perry moved to suppress witness's identification on the ground that admitting it at trial would violate due process. Perry's challenge, the court found, failed because the eyewitness's identification did not result from an unnecessarily suggestive procedure employed by the police.

On appeal, Perry argued that the trial court erred in requiring an initial showing that police arranged a suggestive identification procedure. Suggestive circumstances alone, Perry contended, suffice to require court evaluation of the reliability of an eyewitness identification before allowing it to be presented to the jury. The New Hampshire Supreme Court rejected Perry's argument and affirmed his conviction.

Holding: The Supreme Court held that the Due Process Clause does not require a preliminary judicial inquiry into the reliability of an eyewitness identification when the identification was not procured under unnecessarily suggestive circumstances arranged by law enforcement.

(a) The Constitution protects a defendant against a conviction based on evidence of questionable reliability, not by prohibiting introduction of the evidence, but by affording the defendant means to persuade the jury that the evidence should be discounted

as unworthy of credit. Only when evidence “is so extremely unfair that its admission violates fundamental conceptions of justice,” *Dowling v. United States*, 493 U.S. 342, 352, (1990) does the Due Process Clause preclude its admission.

Dog Scent Discrimination v. Dog Scent Tracking

***Winfrey v. State*, 323 S.W.3d 875 (Tex. Crim. App. 2010)**

Facts: Victim found murdered in his home. Investigators collected forensic evidence from the crime scene, including a partial bloody fingerprint, bloody shoe print and several hair samples, none of which matched Winfrey. Additionally, DNA procured from the crime scene did not match Winfrey or his family members. Winfrey and his children later became suspects and were charged with murder.

To assist in the investigation, Texas Ranger Grover Huff contacted Deputy Keith Pikett, a dog handler with the Fort Bend County Sheriff’s office, Deputy Pikett testified about a ‘scent lineup’ that he conducted nearly three years after the murder in August 2007. He used his three bloodhounds, Quincy, James Bond, and Clue. This involved obtaining scent samples from clothing that the victim was wearing at the time of his death and from six white males, including appellant. The dogs were ‘pre-scented’ on the scent samples obtained from the victim’s clothing. The dogs then walked a line of paint cans containing the scent samples of the six white males. All three dogs alerted on the can containing appellant’s scent sample.

Based on this, Deputy Pikett concluded that appellant’s scent was on the victim’s clothing. Deputy Pikett testified on cross-examination that an alert only establishes some relationship between the scent and objects and that scent detection does not necessarily indicate person-to-person contact. Deputy Pikett also testified on cross-examination that his understanding of the law was that convicting a person solely on a dog scent is illegal.

Holding: The Court of Criminal Appeals found that there was essentially no other evidence to connect Winfrey to the murder besides the dog scent evidence. The court found the evidence legally insufficient to support the conviction and stated the following:

Like our sister courts across the country, we now hold that scent-discrimination lineups, whether conducted with

individuals or inanimate objects, to be separate and distinct from dog-scent tracking evidence. “Even the briefest review of the scientific principles underlying dog scenting reveals that, contrary to the conclusions of many courts, there are significant scientific differences among the various uses of scenting: tracking, narcotics detection, and scent lineups.” Andrew E. Taslitz, *Does the Cold Nose Know? The Unscientific Myth of Dog Scenting*, 42 Hastings L.J. 15, 42 (1990) (explaining that drug detection canines need only determine whether a specific scent is present. Tracking dogs, on the other hand, have the benefit of using both vegetative scents and human scent, while canines performing scent lineups must find one specific scent among many competing, similar scents). The FBI agrees, noting that tracking canines use human scent *and* environmental cues to locate the track of an individual. Allison M. Curran, et al., *Analysis of the Uniqueness and Persistence of Human Scent*, 7 Forensic Sci. Comm. 2 (2005). Accordingly, we conclude that scent-discrimination lineups, when used alone or as primary evidence, are legally insufficient to support a conviction. Like the Supreme Court of Washington, we believe that “[t]he dangers inherent in the use of dog tracking evidence can only be alleviated by the presence of corroborating evidence.” *Loucks*, 656 P.2d at 482. To the extent that lower-court opinions suggest otherwise, we overrule them and expressly hold that when incupatory evidence is obtained from a dog-scent lineup, its role in the court room is merely supportive.

See also, State v. Dominguez, 425 S.W.3d 411, (Tex. App. - Houston [1st Dist.] 2011) (upholding trial court’s suppression of evidence of dog scent identification).

New Scientific Evidence in Child Death Cases

***Ex parte Robbins*, 360 S.W.3d 446 (Tex. Crim. App. 2011, cert. denied May 14, 2012)**

Facts: Tristen Rivet and her mother, Barbara

Ann Hope, lived with Robbins at the home of his mother. On the day of Tristen's death, Ms. Hope left Tristen in Robbins's care. *Id.* At 2:00 p.m., an independent witness observed Tristen playing and eating a snack while in Robbins's care. Ms. Hope returned and relieved Robbins around 4:00 p.m.

Ms. Hope went to wake Tristen around 6:00 p.m. She found Tristen unconscious in her crib with her face, including her nose and mouth, partially covered by her bedding. Ms. Hope rushed Tristen to the living room and began breathing into Tristen's mouth. She then took Tristen outside where Robbins's mother and a neighbor began performing vigorous, adult CPR on Tristen on the ground. Another neighbor came outside to investigate and, drawing on her experience as a medical technician, told the others to stop performing adult CPR because they were compressing Tristen's chest too forcefully and warned that these efforts could actually kill Tristen.

Moments later, the paramedics arrived. Tristen was pronounced dead at 6:53 p.m. shortly after arriving at the hospital.

Robbins was subsequently indicted for capital murder for allegedly causing Tristen's death. The medical examiner, Dr. Patricia Moore, testified that Tristen died from asphyxia due to compression of the chest and abdomen and ruled Tristen's death a homicide. Dr. Moore's testimony was the only direct evidence at trial that a crime had occurred.

Dr. Robert Bux, the deputy chief medical examiner of Bexar County, Texas, gave contrary testimony. However, the jury found Robbins guilty of capital murder, and the trial court sentenced him to life in prison.

Robbins's Habeas Proceedings

Following Robbins's conviction, four additional experts were contacted to re-evaluate Dr. Moore's autopsy findings and trial testimony. Each expert, as well as Dr. Moore herself, concluded that Dr. Moore's original findings and testimony had been incorrect.

Dr. Dwayne Wolf, the deputy chief medical examiner for Harris County, re-evaluated the autopsy findings in March 2007 and concluded that the evidence did not support a finding that the death resulted from asphyxiation by compression or from any other specific cause. Dr. Joye Carter, the former Harris County Medical Examiner and Dr. Moore's supervisor at the time of Mr. Robbins's trial, agreed that the autopsy

findings and facts of the case did not show that a homicide occurred, or indicate Tristen's particular cause of death.

Dr. Moore also admitted that her own original findings and testimony were erroneous. In a May 2007 letter sent to the Montgomery County District Attorney, Dr. Moore stated that given her "review of all the material from the case file and having had more experience in the field of forensic pathology," she felt that "an opinion for a cause and manner of death of . . . undetermined is best for this case."

Robbins filed an application for a writ of habeas corpus in June 2007 with the 410th Judicial District Court in Montgomery County, Texas, asserting that in light of this newly discovered evidence, "no rational juror would find [Mr. Robbins] guilty beyond a reasonable doubt of the offense." Robbins also explained that his "right to a fair trial by a fair and impartial jury . . . was violated because his conviction was based on testimony material to the State's case that has now been determined to be false."

In its initial response, the State recommended that Robbins be granted a new trial because "the jury was led to believe and credit facts that were not true." Rather than accept the State's recommendations, the trial court appointed Dr. Thomas Wheeler, the Chairman of the Department of Pathology at Baylor College of Medicine in Houston, to determine, if possible, the means and manner of Tristen's death. After conducting an independent examination, Dr. Wheeler also concluded that Dr. Moore's trial testimony was "not justified by the objective facts and pathological findings" and that there were no physical findings to support the conclusion that a homicide had occurred.

In August 2008, Robbins and the State, again, recommended to the trial court that Robbins be granted a new trial. Yet again, rather than agree to the joint recommendations from the parties, the trial court ordered that the parties engage in discovery. Dr. Wheeler and Dr. Wolf were subsequently deposed and each reaffirmed their findings that the evidence did not support a finding that a homicide had occurred. In Dr. Moore's deposition, she confirmed that her trial testimony was not justified by the objective facts and pathological findings.

Around this same time, Justice of the Peace Edith Connelly reopened the inquest into Tristen's death and appointed Dr. Linda Norton to examine the evidence. Dr. Norton also disagreed with Dr. Moore's trial testimony. Dr. Norton stated that the cause of death was

asphyxia by suffocation and placed the estimated time of death between 2:30 p.m. and 5:00 p.m. Dr. Norton ultimately concluded that she believed Tristen had been killed, but determined that she could not conclude beyond a reasonable doubt that Robbins was in any way responsible.

Dr. Norton was the only expert of the six pathologists consulted by the habeas court to conclude that Tristen died from a homicide.

On January 15, 2010, the State, for the first time, urged that relief be denied to Robbins. The trial court, however, found that Robbins was entitled to a new trial because the verdict against him was “not obtained by fair and competent evidence, but by admittedly false testimony that was unsupported by objective facts and pathological findings and not based on sufficient expertise or scientific validity.”

Court’s Holding: The Texas Court of Criminal Appeals in a 5-4 decision, rejected the trial court’s recommendations and denied relief. The five-judge majority concluded that because Robbins “failed to prove that the new evidence unquestionably establishes his innocence,” he was not entitled to relief on his claim of actual innocence of the crime for which he was convicted.

The majority then departed from the trial court’s findings and held that false testimony had not been used to convict Mr. Robbins. Notwithstanding the agreement, among the consulted experts that Dr. Moore’s findings and testimony were incorrect, the majority refused relief because none of the experts affirmatively proved the negative proposition that “Tristen could not have been intentionally asphyxiated.” Thus, the majority concluded Robbins did not “have a due process right to have a jury hear Moore’s re-evaluation.”

In a dissent joined by two other judges, Judge Cochran identified her “extremely serious concern” about the increased “disconnect between the worlds of science and of law” that allows a conviction to remain in force when the scientific basis for that conviction has since been rejected by the scientific community. Adding to this concern was the dissent’s observation that this disconnect “has grown in recent years as the speed with which new science and revised scientific methodologies debunk what had formerly been thought of as reliable forensic science has increased.” As a result, the dissent argued that “[f]inality of judgment is essential in criminal cases, but so is accuracy of the result - an accurate result that will stand the test of time and changes in scientific

knowledge.”

Looking at the facts of Robbins’s conviction, the dissent believed this case created an appropriate opportunity to address this growing concern. Because Dr. Moore’s findings and trial testimony have been uniformly rejected, including by Dr. Moore herself, the dissent urged that Robbins “did not receive a fundamentally fair trial based upon reliable scientific evidence.”

Indeed, Judge Cochran explained that she “suspect[ed] that the [United States] Supreme Court will one day hold that a conviction later found to be based upon unreliable scientific evidence deprives the defendant of a fundamentally fair trial and violates the Due Process Clause of the Fourteenth Amendment because it raises an intolerable risk of an inaccurate verdict and undermines the integrity of our criminal justice system.”

Judge Alcala dissented separately, concluding that Robbins “is entitled to relief on his application for a writ of habeas corpus on the ground that he was denied due process of law by the State’s use of false testimony to obtain his conviction.”

In 2013, the Legislature enacted Art. 11.073, Tex. Code Crim. Proc. This statute was amended in 2015. The following is the current version of Art. 11.073:

ART. 11.073, PROCEDURE
RELATED TO CERTAIN
SCIENTIFIC EVIDENCE

- (a) This article applies to relevant scientific evidence that:
 - (1) was not available to be offered by a convicted person at the convicted person’s trial; or
 - (2) contradicts scientific evidence relied on by the state at trial.
- (b) A court may grant a convicted person relief on an application for a writ of habeas corpus if:
 - (1) the convicted person files an application, in the manner provided by Article 11.07, 11.071, or 11.072, containing specific facts indicating that:
 - (A) relevant scientific evidence is currently available and was not available at the time of the convicted person’s trial because the evidence was not ascertainable through the exercise of reasonable diligence by the convicted person before the date of or during the convicted

- person's trial; and
- (B) the scientific evidence would be admissible under the Texas Rules of Evidence at a trial held on the date of the application; and
- (2) the court makes the findings described by Subdivisions (1)(A) and (B) and also finds that, had the scientific evidence been presented at trial, on the preponderance of the evidence the person would not have been convicted.
- (c) For purposes of Section 4(a)(1), Article 11.07, Section 5(a)(1), Article 11.071, and Section 9(a), Article 11.072, a claim or issue could not have been presented previously in an original application or in a previously considered application if the claim or issue is based on relevant scientific evidence that was not ascertainable through the exercise of reasonable diligence by the convicted person on or before the date on which the original application or a previously considered application, as applicable, was filed.
- (d) In making a finding as to whether relevant scientific evidence was not ascertainable through the exercise of reasonable diligence on or before a specific date, the court shall consider whether the field of scientific knowledge, a testifying expert's scientific knowledge, or a scientific method on which the relevant scientific evidence is based has changed since:
- (1) the applicable trial date or dates, for a determination made with respect to an original application; or
- (2) the date on which the original application or a previously considered application, as applicable, was filed, for a determination made with respect to a subsequent application.

On November 26, 2014, the Court of Criminal Appeals reconsidered the *Robbins* case, this time under the recently enacted Art. 11.073. *Ex Parte Robbins*, 478 S.W.3d 678 (Tex. Crim. App. 2014). Applying 11.073, the majority concluded that the medical examiner's post-trial reconsideration of her initial conclusion from the autopsy that the cause of child victim's death was asphyxia by strangulation and that manner of death was homicide, following which she concluded that cause and manner of death were "undetermined," was new scientific evidence that contradicted scientific evidence relied upon by State at trial which was not available at time of original application.

The majority opinion further explained that since the revised opinion was based on a review of medical evidence and more experience in the field, it was new scientific evidence based on change of scientific

knowledge that was not available at time of original habeas application.

Judge Cochran, in her concurring opinion, traced the history of Art. 11.073, noting that,

"By 2009, the Texas Legislature, at the urging of the Innocence Project of Texas, began reacting to the problems of prior convictions based on bad scientific evidence."

As noted by Judge Cochran, these efforts ultimately resulted in the enactment of Art. 11.073.

Finally, in finding relief appropriate in the *Robbins* case, Judge Cochran stated,

"Regardless of whether a conviction is based on an unreliable field of science or unreliable scientific testimony, the result is the same: an unreliable verdict that cannot stand the test of time. It is built upon the shifting sands of "junk" science or a "junk" scientist, and it is the purpose of Article 11.073 to provide a statutory mechanism for relief and a retrial based upon 'good' science and 'good' scientific testimony."

Judge Johnson's concurring opinion noted the following:

"The various positions on statutory interpretation seem to agree that the legislative history indicates that the intent of this statute is to provide relief to those who were convicted on science or scientific methodology that is now known to be unsound."

Judge Johnson also recognized that Art. 11.073 would apply to various other scientific fields by stating:

"As has been noted, some examples of 'contradicted scientific evidence relied on by the state at trial' include arson, infant trauma, bullet-lead analysis, bite marks, some ballistics tests, blood-spatter patterns, and scent line-ups. Some such evidence has involved misinterpretation based on out-dated knowledge, some are simply junk science that has never been subjected to any kind of scientific investigation. Whether 'debunked' or 'refined' for increased accuracy, changes in scientific knowledge in general, and therefore changes in scientific testimony by individuals, must be acknowledge and addressed."

Dissenting opinions by Presiding Judge Keller, joined by Judge Hervey, and by Judge Keasler, disputed whether 11.073 applied to the *Robbins* case, but recognized its broad applicability in other situations. For instance, in analyzing the legislative history, Judge Keasler stated,

"The Senate Research Center's Bill Analysis summarized the bill's intent as 'amend[ing] the Code of Criminal Procedure relating to applications for writs of habeas corpus relief based on relevant scientific evidence of false and discredited forensic testimony. . . . Recent examples of such evidence include dog-scent lineups, misinterpreted indicators of arson, and infant trauma."

Judge Keasler further stated:

"In support of H.B. 967, an identical companion bill to S.B. 344, Representative Turner was more detailed in his explanation of the bill's intended purpose. He began by stating that when an individual is 'convicted based on junk science or critical forensic testimony that is disproved by later scientific advancements, the courts cannot presently agree whether or not the existing law provides a basis for relief. As examples of disproved science, he specifically identified discredited dog scent line-ups, misinterpreted indicators of arson, and mistaken assumptions about infant trauma. . . . From Representative Turner's express intent and the comments and questions from the committee members and witnesses alike, it is clear that, while this particular bill was left pending in committee, the proposed legislation targeted past scientific evidence undermined by subsequent advances in the particular field."

The state's rehearing motion was subsequently granted and on January 7, 2016, the court denied the rehearing motion. *Ex parte Robbins*, ___ S.W.3d ___ (Tex. Crim. App. 2016), 2016 WL 370157.

***Ex Parte Henderson*, 246 S.W.3d 690 (Tex. Crim. App. 2007), 384 S.W.3d 833 (Tex. Crim. App. 2012)**

Facts: Henderson was convicted of capital murder and sentenced to death. The allegation was that she caused the death of a child, Brandon Baugh. Henderson's defense was that Brandon's death was the result of an accidental fall.

At the time of trial, Dr. Roberto Bayardo, the medical examiner for Travis County, testified that it was impossible for Brandon's extensive brain injuries to have occurred in the way Henderson stated. In his opinion, Brandon's injuries had to have resulted from a blow intentionally struck by Henderson. He testified that, "I would say the baby was caught up with the hands by the arms along the body and then swung and slammed very hard against a flat surface."

In a subsequent writ, Henderson submitted affidavits and reports that indicated that recent advances in the area of biomechanics and physics suggest that it is possible that Brandon's head injuries could have been caused by an accidental short-distance fall. Additionally, Dr. Bayardo submitted an affidavit which recanted his trial testimony. His affidavit stated:

"Since 1995, when I testified at Cathy Henderson's trial, the medical profession has gained a greater understanding of pediatric head trauma and the extent of injuries that can occur in infants as a result of relatively short distance falls, based in part on the application of principles of physics and biomechanics. Specifically, and as shown in the reports that I have read, even a fall of a relatively short distance onto a hard surface can cause the degree of injury that Brandon Baugh experienced. If this new scientific information had been available to me in 1995, I would have taken it into account before attempting to formulate an opinion about the circumstances leading to the injury.

I have reviewed the affidavit of John Plunkett dated May 18, 2007, and I agree with his opinion. Based on the physical evidence in the case, I cannot determine with a reasonable degree of medical certainty whether Brandon Baugh's injuries resulted from an intentional act or an accidental fall. In fact, had the new scientific information been available to me in 1995, I would not have been able to testify the way I did about the degree of force needed to cause Brandon Baugh's head injury."

Holding: The Court of Criminal Appeals majority held that Dr. Bayardo's re-evaluation of his

1995 opinion is a material exculpatory fact and ordered the trial court to further develop the evidence.

Judge Price concurred, and stated that,

“Under these circumstances, it is at least arguable that the evidence is not even legally sufficient to sustain a conviction; that is, a rational jury could not convict the applicant of capital murder. In any event, it is evident that the applicant has presented a plausible claim that no reasonable juror *would* have found her guilty of a *capital* homicide - at least not to a level of confidence beyond a reasonable doubt.”

The dissenting Judges argued that the new scientific evidence did not establish any recognized claim for relief under Chapter 11 of the Code of Criminal Procedure.

Henderson Holding on Remand

On December 5, 2012, the Court of Criminal Appeals issued a decision granting habeas relief and ordering a new trial in the *Henderson* case. *Ex Parte Henderson*, 384 S.W.3d 833 (Tex. Crim. App. 2012). In the Court’s per curiam opinion, the Court accepted the trial court’s findings of fact that new scientific evidence that a short distance fall could have caused the head injury in this case proves that no reasonable juror would have convicted her in light of this new evidence. The Court of Criminal Appeals found that this new scientific evidence did not establish that *Henderson* was actually innocent but that it did establish a due process violation.

Judge Price filed a concurring opinion and stated that relief was being granted on the basis of the inadvertent use of false evidence to convict Henderson. Judge Price stated that Henderson had proven that her conviction was based, in critical part, upon an opinion from the medical examiner that he has now disavowed because it has been shown by subsequent scientific developments to be highly questionable. The distinction between *Henderson* and *Ex Parte Robbins* that Judge Price drew is that *Henderson* is based on new scientific developments that show the head injury can be caused by a short distance fall and, in *Robbins*, the medical examiner simply changed her mind.

Judge Cochran also filed concurring opinion, joined by Judges Womack, Johnson and Alcalá. Judge Cochran reviewed the evidence from the writ hearing and

stated,

“In sum, all but one of these ten medical and scientific experts agreed that Dr. Bayardo’s trial testimony was now known to be scientifically inaccurate: Brandon’s autopsy results did not establish that his death was the product of an intentional homicide. Indeed, all but one of these experts basically admitted that science cannot answer the question of whether Brandon’s death was the result of an intentional homicide. It could have been an intentional homicide; it could have been an accident.”

Judge Cochran agreed that Henderson did not receive a fundamentally fair trial based upon reliable scientific evidence.

Judge Alcalá also filed a separate concurrence. Judges Keller, Keasler and Hervey dissented.

Sodium Poisoning

***Ex Parte Overton*, 2012 WL 1521978 (Tex. Crim. App. 2012)**

Facts: A writ was filed alleging actual innocence, suppression of exculpatory evidence and ineffective assistance of counsel. Overton was convicted of capital murder based on allegedly intentionally causing a child to ingest acute levels of sodium or by failing to seek medical care.

Holding: The Court of Criminal Appeals remanded the case to the trial court to resolve the contested issues. Notably, Judge Cochran, joined by Judges Price and Johnson, filed a statement concurring in the remand order stating:

“I agree that this application for a writ of habeas corpus should be remanded to the trial court for further development on the claims set out in the remand order. I think that we should give more explicit guidance to the trial court, however, as this appears to be a capital-murder conviction that depends, in many respects, upon the scientific validity and accuracy of the medical testimony offered into evidence at the original trial.

The judiciary must be ever vigilant to ensure that verdicts in criminal cases are based solely upon reliable, relevant scientific evidence—scientific evidence that will hold up under later scrutiny. I have previously expressed my concern about ‘the fundamental disconnect between the worlds of science and of law.’ *Ex Parte Robbins*, No. AP-76464, ___ S.W.3d ___, 2011 WL 2555665 at *19 (Tex. Crim. App. June 29, 2011) (Cochran, J., dissenting)

This disconnect between changing science and reliable verdicts that can stand the test of time has grown in recent years as the speed with which new science and revised scientific methodologies debunk what had formerly been thought of as reliable forensic science has increased. The potential problem of relying on today’s science in a criminal trial (especially to determine an essential element such as criminal causation or the identity of the perpetrator) is that tomorrow’s science sometimes changes and, based upon that changed science, the former verdict may look inaccurate, if not downright ludicrous. But the convicted person is still imprisoned. Given the facts viewed in the fullness of time, today’s public may reasonably perceive that the criminal justice system is sometimes unjust and inaccurate. Finality of judgment is essential in criminal cases, but so is accuracy of the result - an accurate result that will stand the test of time and changes in scientific knowledge.

Id. The problem in this case, as in *Robbins*, is not that the science itself has evolved, but that it is alleged that the scientific testimony at the original trial was not fully informed and did not take into account all of the scientific evidence now available.

Overton Holding on Remand

On remand, in *Ex parte Overton*, 444 S.W.3d 632 (Tex. Crim. App. 2014), the court granted relief on the basis that defense counsel’s failure to present

physician’s expert testimony regarding sodium intoxication constituted ineffective assistance of counsel when the defense could have presented testimony from a physician, who was a leading expert in hyponatremia describing the mortality rate with salt intoxication as being very high and stating that it was extremely unlikely that the victim would have lived, irrespective of how quickly medical care was given.

Forensic Visual Science

***Ex Parte Spencer*, 337 S.W.3d 869 (Tex. Crim. App. 2011)**

Facts: Spencer convicted of aggravated robbery based on eyewitness testimony. On his Application for Writ of Habeas Corpus, the defense called Dr. Michel, a forensic visual science expert, to testify at the writ hearing. Dr. Michel’s expert testimony was that the eyewitnesses could not have seen the face of the person exiting the BMW because of darkness, distance, and movement. Specifically, Dr. Michel testified that Cotton would not have been able to make a facial identification of a person jumping a fence 113 feet away from him. He also stated that Stewart was so far from the BMW that he would not be able to make a facial identification even in daylight, and Oliver could not have made a facial identification of a person exiting the passenger side of the BMW because her window was 123 feet away from the car. Applicant says that the State’s expert agreed that with the distance and lighting conditions and Oliver would not have been able to identify facial features of the individuals exiting the car. Applicant’s argument is that it was physically impossible for the eyewitnesses to make a facial identification.

Holding: The Court of Criminal Appeals denied relief. The Court stated:

“First, while the science of forensic visual testing may be new, the evidence Applicant relies on is not newly discovered or newly available. Shortly after the 1987 offense, investigators were able to observe the scene from the vantage point of the eyewitnesses while the conditions were similar to the way they were the night of the offense. The evidence gathered by investigators for both the State and the defense was presented to the jury. The issues of lighting, distance, and the witnesses’ ability to identify Applicant were raised at trial. The jury heard the evidence

regarding the streetlight in the alley, the light in the back of one of the houses, and the light in the car, as well as the defendant's evidence about how far away each witness was from the car. Three separate juries chose to believe the witnesses. Applicant's expert observed the scene many years later, in 2003, when the conditions from the night of the offense were unable to be replicated. For example, Gladys Oliver's house had been torn down, there were new windows and a new fence at Cotton's house, a new shed had been built, the lighting was different, tree growth had changed after 16 years, and there was no way to ascertain exactly where in the alley the car had been on the night of the offense. Based on this, the expert determined that it was physically impossible for the witnesses to see the face of the person exiting the car.

We agree with the State that not all scientific advances can be treated equally. While we have considered advances in science when determining whether certain evidence, such as DNA, is newly discovered or newly available, the evidence presented by Applicant is not the sort of evidence that is capable of being preserved and tested at a later date. Forensic visual science may be new, but there is no way for the forensic visual expert to test the conditions as they existed at the time of the offense because there is no way to replicate the lighting conditions.

We will consider advances in science and technology when determining whether evidence is newly discovered or newly available, but only if the evidence being tested is the same as it was at the time of the offense. Thus, the science or the method of testing can be new, but the evidence must be able to be tested in the same state as it was at the time of

the offense.

Applicant says that 'scientific evidence establishes the wrongfulness' of his conviction. However, an expert report saying that it was too dark and the car was too far away for the eyewitnesses to have seen Applicant does not affirmatively establish his innocence. All it does is attempt to discredit the witnesses who stated that they saw Applicant get out of the victim's car."

Grooming of Children For Sexual Molestation

***Morris v. State*, 361 S.W.3d 649 (Tex. Crim. App. 2011)**

Facts: Morris was convicted of indecency with a child. Issue was whether grooming of children for sexual molestation, as a phenomenon, is a legitimate subject of expert testimony.

Holding: The court held that grooming of children for sexual molestation, as a phenomenon, is a legitimate subject of expert testimony of which a law enforcement officer with a significant amount of experience with child sex abuse cases may be qualified to testify.

Polygraph Evidence

***Leonard v. State*, ___ S.W.3d ___, 2012 WL 715981 (Tex. Crim. App. 2012), rehearing granted, 385 S.W.3d 570, 2012 WL 5864407 (Tex. Crim. App. 2012).**

Facts: State petitioned to revoke Leonard's community supervision based on results of polygraph examinations that were part of his mandatory sex offender treatment program. Trial court granted petition, adjudicated Leonard and imposed a seven year prison sentence. The issue was whether the trial court erred in considering evidence of the failed polygraph examination in deciding whether to revoke Leonard's community supervision.

Holding: The Court of Criminal Appeals held that the fact that the defendant failed five polygraph examinations was admissible in an adjudication and revocation of community supervision hearing. The court restated the previous rule that polygraphs were not admissible before a jury. However, the court held that because adjudication hearings are administrative

proceedings, in which there is no jury and the judge is not determining guilt of the original offense, that the results of a polygraph examination is admissible if it qualifies as the basis for an expert opinion under Tex. Rules of Evid. 703 and 705(a).

Judge Cochran, joined by Judges Price, Womack and Johnson, dissented, stating,

“We should not permit or condone ‘trial by polygraph’ or ‘revocation by polygraph’ especially when there was not a scintilla of evidence introduced at this revocation hearing concerning the general scientific reliability of polygraph testing or its scientific reliability in this particular case.”

On November 21, 2012, the Court issued its opinion on rehearing in *Leonard v. State*, 385 S.W.3d 570, 2012 WL 5869407 (Tex. Crim. App. 2012). Judge Alcala changed her vote, thus changing the result of the case. The Court’s decision changed with the conclusion being that polygraphs were not admissible for any reason. The Court’s opinion on rehearing held that Rule 703, Tex. Rules of Evidence, does not allow an expert to present opinion testimony based on scientifically unreliable facts or data, and that polygraphs are unreliable.

DNA

***Ex Parte Kussmaul*, 548 S.W.3d 606 (Tex. Crim. App. 2018)**

Facts: Four defendants. Three pled guilty to sexual assault and one found guilty by jury of capital murder. DNA testing excluded all four as contributor of the DNA found on the victim.

Holding: Actual innocence argument rejected in capital murder and sexual assault cases. However, court grants relief under Art. 11.073, Tex. Code Crim. Proc. and holds that had the Y-STR, DNA testing results that were favorable to the petitioners been presented at sexual-assault and murder trial, petitioners, on preponderance of the evidence, would not have either pled guilty to sexual assault, as to three of the petitioners, or, as to one of the petitioners, been convicted at trial of capital murder, as required for petitioners.

Physical Signs of Sexual Assault on a Child

***Ex Parte Mayhugh*, 512 S.W.3d 285 (Tex.**

Crim. App. 2016).

Facts: San Antonio Four case. Four women convicted of sexual offenses against two young girls.

Holding: Court held that habeas relief was required under Art. 11.073, Tex. Code Crim. Proc. based on newly available, relevant scientific evidence regarding hymenal injuries, for four defendants who were convicted of aggravated sexual assault of a child and indecency with a child based on alleged gang-rapes of two young girls who were one of the defendant’s nieces, where new scientific studies within the field of pediatrics showed that hymens that healed from injury did not leave scars in pubertal and prepubertal girls, those studies contradicted the medical testimony presented at trial, physician who testified at trial retracted her testimony as to physical indicators of past trauma, and physician later agreed with the defense that there were no definitive signs of sexual abuse.

Death Penalty/Mental Retardation

***Ex Parte Westbrook*, 2012 WL 1142399 (Tex. Crim. App. 2012); *Ex Parte Maldonado*, 2012 WL 1439056 (Tex. Crim. App. 2012); *Ex Parte Escobedo*, 2012 WL 982907 (Tex. Crim. App. 2012); *Ex Parte Matamoros*, 2011 WL 6241295 (Tex. Crim. App. 2011); *Ex Parte Butler*, 2011 WL 6288411 (Tex. Crim. App. 2011); *Ex Parte Hunter*, 2012 WL 1439050 (Tex. Crim. App. 2012).**

All cases remanded by Court of Criminal Appeals to trial court to hold hearings concerning testimony from Dr. George Denkowski that these death row inmates were not mentally retarded and thus, eligible for execution. Denkowski’s methods had been criticized as being unscientific and artificially inflating intelligence scores to make defendant’s eligible for the death penalty. The Texas State Board of Examiners of Psychologists issued a reprimand against Denkowski; where he was forced to agree not to conduct intellectual disability evaluations in future criminal cases.

False Testimony Concerning Abel Assessment on Sexual Attraction to Children

***In the Matter of MPA*, 364 S.W.3d 277 (Tex. 2012)**

Habeas petitioner who challenged 20-year sentence imposed for delinquency adjudication of sexual assault on seven-year-old girl showed that state would not have established reliability of test assessing

petitioner's sexual interest in female children under age of 14 had state's expert testified truthfully on reliability of test at disposition stage; as applied to present case involving an adolescent, test had only a 65% accuracy rate, was subject to at least some criticism in the literature, and had no support from independent studies.

Current Issues

Microscopic Hair Analysis

After an investigation of cases in which the FBI conducted microscopic hair analysis of crime scene evidence, the agency concluded that 26 out of 28 FBI agents/analysts provided either testimony with erroneous statements or submitted laboratory reports with erroneous statements.

As a result of the FBI review, the Texas Forensic Science Commission began its own review. The FSC statement said:

“For several decades, the FBI assisted state and local crime laboratories in training hair examiners, including many examiners in Texas. The fact that Texas examiners received some of their training from the FBI *does not necessarily mean* they made statements of concern similar to those identified in the FBI review. However, to determine whether the issues identified by the FBI are also present in the testimony provided by state, county and municipal laboratories, the Texas Forensic Science Commission decided the most prudent course would be to review a sub-sampling of hair microscopy cases from all 20 laboratories (including 12 DPS regional labs) that performed hair microscopy examinations.”

...

The review panel will limit its review of cases to those in which an individual was convicted of a crime, there was a positive, probative association made by a hair examiner in a laboratory report, and the examiner either: (a) provided subsequent testimony as an expert witness at trial; or (b) included scientifically invalid language in the report to such a degree that the defendant's plea could have been involuntary.

...

A properly trained hair examiner can make an association between a questioned hair and a known hair sample from an individual. However, the examiner cannot provide a scientifically valid estimate of the rareness or frequency of that association. *The examiner's*

testimony should reflect the fact that hair comparison cannot be used to make a positive identification of an individual. In other words, hair comparison can indicate, at the broad class level, that a contributor of a known sample could be included in a pool of people as a possible source of the hair evidence. However, the examiner should not give an opinion as to the probability or the likelihood of a positive association.”

DNA Mixture Interpretation

The Texas Forensic Science Commission is also investigating this issue. The Forensic Science Commission's statement concerning this stated:

“In May 2015, the FBI notified the public that it had identified some errors in the population data used to generate statistical calculations when analyzing DNA cases by crime laboratories around the country. The changes in the population statistics were attributable to human error in data entry and technology limitations at the time the database was created in the 1990's. The errors, being nominal, were not expected to have any material impact on the statistics derived in criminal cases. Empirical studies in and outside of Texas showed the differences in statistical calculations were minor. Regardless, Texas laboratories sent notifications to the criminal justice community in an abundance of caution, offering to provide statistical re-analysis upon request.

Some prosecutors accepted the offer for re-analysis in the notices, not expecting any significant difference in statistics but making the requests in an abundance of caution in cases set for trial. When these prosecutors received their new reports, they noticed significant changes in the statistics results in some (but not all) of the cases. The cases involved complex DNA mixtures, usually with difficult evidentiary samples such as gun swabs, steering wheel swabs, items of clothing, or other examples of “touch DNA” where multiple people may have contributed DNA to the sample.

The prosecutors went back to the laboratories and also sought the Texas Forensic Science Commission's help in understanding the cause of the unexpected statistical changes. The changes were attributable to the fact that the

evidence was originally analyzed *before* certain important revisions were made in laboratory mixture interpretation protocols. These revisions were made due to an evolving understanding among forensic scientists of how to apply certain statistical methods to increasingly complex biological samples, particularly a statistical method referred to as the combined Probability of Inclusion/Exclusion (“CPI/CPE”). Though DNA analysis is based on sound science, well-defined guidelines for interpretation are necessary when analyzing DNA samples containing multiple contributors, because of the complexity of the samples and the possibility of missing data (e.g., allele dropout and other stochastic effects).

The results of the Texas re-analysis requests highlighted in one state what has been an issue of concern in the forensic DNA community for years - that mixture interpretation is challenging; there can be wide variation from laboratory to laboratory and even within laboratories on how mixture evidence is interpreted; guidance on how to interpret mixtures properly was described in various journal publications and websites but it was not as centralized or proscriptive as it could have been; and efforts by the federal government (in particular the National Institute of Standards and Technology) to train laboratories and raise red flags regarding mixture interpretation problems they observed in two major studies (MIX05 and MIX13) took many years to transfer to the local level.

On August 21, 2015, Dr. Vincent Di Maio, Presiding Officer of the Texas Forensic Science Commission, published a letter to the Texas Criminal Justice Community. The letter explained the issues identified above and suggested that any prosecutor, defendant or defense attorney with a currently pending case involving a DNA mixture in which the results could impact the conviction consider requesting confirmation that CPI/CPE was calculated by the laboratory using “current and proper mixture interpretation protocols.”

Bite Mark Evidence

From the Texas Tribune, February 12, 2016:

“The Texas Forensic Science Commission on Friday recommended that prosecutors temporarily stop using bite-mark evidence in criminal cases until questions are answered about its scientific validity.

A panel of the commission has been investigating the reliability of bite-mark evidence following several exonerations across the country in criminal cases where convictions were won partly with bite-mark analysis. One primary concern is “the ability of human skin to record bite marks with sufficient fidelity” to be of use for future analysis, commission general counsel Lynn Garcia reported to the group.

The New York-based Innocence Project asked the commission to investigate its use after the conviction integrity unit in the Dallas County District Attorney’s Office cleared Steven Mark Chaney of murder. Chaney served 28 years in prison on a wrongful conviction that relied on testimony from two forensic dentists, according to the Innocence Project.

The *Chaney* case is currently pending before the Court of Criminal Appeals.

Bloodstain Pattern Analysis

The Texas Forensic Science Commission (FSC) is investigating the validity of bloodstain pattern evidence. Recently, the FSC heard testimony regarding the bloodstain pattern evidence used to convict Joe Bryan over 30 years ago of murder of his wife. Challenges have been made as to the scientific validity of this evidence and the training of the police officers who provide this testimony. Details of the *Bryan* case and the controversy surrounding blood spatter evidence are found in a two-part investigation by ProPublic and the New York Times by Pam Coloff published earlier this year.

In *Strengthening Forensic Science in the United States: A Path Forward*, pp. 178-79, the National Research Council stated, “Scientific studies support some aspects of bloodstain pattern analysis. One can tell, for example, if the blood spattered quickly or slowly, but some experts extrapolate far beyond what can be supported. Although the trajectories of bullets are linear, the damage that they cause in soft tissue and the complex patterns that fluids make when exiting wounds are highly variable. For such situations, many experiments must be conducted to determine what characteristics of a

bloodstain pattern are caused by particular actions during a crime and to inform the interpretation of those causal links and their variabilities. For these same reasons, extra care must be given to the way in which the analyses are presented in court. The uncertainties associated with bloodstain pattern analysis are enormous.”

Toolmark and Firearms Analysis

In *Strengthening Forensic Science in the United States: A Path Forward*, p. 154, the following is stated: “Because not enough is known about the variabilities among individual tools and guns, we are not able to specify how many points of similarity are necessary for a given level of confidence in the result. Sufficient studies have not been done to understand the reliability and repeatability of the methods. The committee agrees that class characteristics are helpful in narrowing the pool of tools that may have left a distinctive mark. Individual patterns from manufacture or from wear might, in some cases, be distinctive enough to suggest one particular source, but additional studies should be performed to make the process of individualization more precise and repeatable.”

Shaken Baby Syndrome

- Theory is that the following factors, known at the triad, prove a child was shaken
 - Subdural hematoma
 - Retinal hemorrhages
 - Brain swelling
 - Absence of any other explanation or an explanation deemed inconsistent with the injuries
- Scientific advances have disproven the claim that nothing can cause the triad except shaking
- Biomechanical research has disproven the hypothesis that shaking alone can cause serious brain injury and death with SDH and RH
- Scientific advances have undermined the hypothesis that the last person with the child must have been the abuser - the injuries cannot be timed
- Scientific advances have disproven the claim that the injuries had to have been caused by force equal to a multi-story fall or car crash

See, The Forensic Unreliability of the Shaken Baby Syndrome, by Randy Papetti, published by American Forensic Pathology International.

Ex Parte Henderson, 384 S.W.3d 833 (Tex. Crim. App. 2012)

Wisconsin v. Edmunds, 746 N.W.2d 590 (Wis. 2008)

Del Prete v. Thompson, 10 F.Supp.3d 907 (N.D.

III. 2014).