

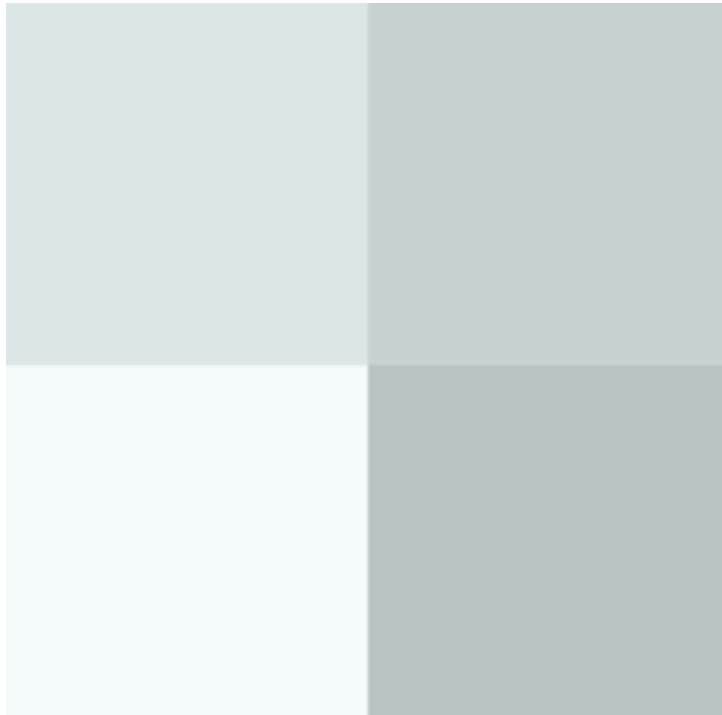


National Judicial College of Australia

We, the Gatekeepers

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Program Synopsis

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Overview

A problem in three parts

The Science

In 2005, the US Congress authorised the National Academy of Sciences to conduct a study on forensic science, that is to say, the application of scientific or technical practices to the recognition, collection, analysis, and interpretation of evidence for forensic purposes. This was done in response to an increasing concern over the preceding decade about the validity and reliability of some important forms of forensic evidence after an alarming number of defendants had been found to have been wrongfully convicted because of ‘expert’ evidence that was demonstrated to be invalid, inaccurate, unreliable or just plain ‘junk’.

The result was a report released in 2009 – *Strengthening Forensic Science in the United States: A Path Forward* (**NAS Report**) – which confirmed the experience (and suspicions) of many stakeholders in the trial process around the world. If anything, the problems with forensic evidence were far more rudimentary and widespread than anyone had until that point in time appreciated. It was particularly critical of weaknesses in the scientific underpinnings of several forensic disciplines routinely used in the criminal justice system. For example, this appears in the preface (at 7):

Often in criminal prosecutions and civil litigation, forensic evidence is offered to support conclusions about ‘individualization’ (sometimes referred to as ‘matching’ a specimen to a particular individual or other source) or about classification of the source of the specimen into one of several categories. **With the exception of nuclear DNA analysis, however, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source.** In terms of scientific basis, the analytically based disciplines generally hold a notable edge over disciplines based on expert interpretation. But there are important variations among the disciplines relying on expert interpretation. For example, there are more established protocols and available research for fingerprint analysis than for the analysis of bite marks. There also are significant variations within each discipline. For example, not all fingerprint evidence is equally good, because the true value of the evidence is determined by the quality of the latent fingerprint image. These disparities between and within the forensic science disciplines highlight a major problem in the forensic science community: **The simple reality is that the interpretation of forensic evidence is not always based on scientific studies to determine its validity.** This is a serious problem. Although research has been done in some disciplines, there is a notable dearth of peer-reviewed, published studies establishing the scientific bases and validity of many forensic methods.

The NAS Report made clear that some types of problems, irregularities and miscarriages of justice could not simply be attributed to a handful of rogue analysts or underperforming laboratories, but are systemic and pervasive – the result of factors including a high degree of fragmentation (including disparate and often inadequate training and educational requirements, resources, and capacities of laboratories), a lack of standardization of the disciplines, insufficient high-quality research and education, and a scarcity of peer-reviewed studies establishing the scientific basis and validity of many

routinely used forensic methods. It found that shortcomings in the forensic sciences were especially prevalent among the feature-comparison disciplines, many of which, the report said, lacked well-defined systems for determining error rates and had not done studies to establish the uniqueness or relative rarity or commonality of the particular features examined. In addition, proficiency testing, where it had been conducted, showed instances of poor performance by specific examiners. In short, the report concluded that ‘much forensic evidence – including, for example, bitemarks and firearm and toolmark identifications – is introduced in criminal trials without any meaningful scientific validation, determination of error rates, or reliability testing to explain the limits of the discipline’.

In 2015, when President Obama asked the President’s Council of Advisors on Science and Technology (PCAST) to consider whether there were additional steps that could usefully be taken on the scientific side to strengthen the forensic-science disciplines and ensure the validity of forensic evidence used in the legal system, PCAST concluded that there were two important gaps: (1) the need for clarity about the scientific standards for the validity and reliability of forensic methods and (2) the need to evaluate specific forensic methods to determine whether they have been scientifically established to be valid and reliable.

PCAST attempted to close these gaps in the case of forensic ‘feature-comparison’ methods – that is, methods that attempt to determine whether an evidentiary sample (eg from a crime scene) is or is not associated with a potential ‘source’ sample (eg from a suspect), based on the presence of similar patterns, impressions, or other features in the sample and the source (such as DNA, hair, latent fingerprints, firearms and spent ammunition, toolmarks and bite marks, shoeprints and tyre tracks and handwriting) – through a report entitled, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*, which was published in 2016 (**‘PCAST Report’**). Serious flaws were found in all methods examined (fingerprints, bite marks, shoe prints, blood splatter and hair analysis) with the exception of nuclear DNA analysis (cf mitochondrial DNA analysis).

As to that, the pivotal role played by nuclear DNA analysis in the development of this new awareness of the unreliability of much of what passed before as expert testimony was singled out in the PCAST Report (at 2-3):

Ironically, it was the emergence and maturation of a new forensic science, DNA analysis, in the 1990s that first led to serious questioning of the validity of many of the traditional forensic disciplines. When DNA evidence was first introduced in the courts, beginning in the late 1980s, it was initially hailed as infallible; but the methods used in early cases turned out to be unreliable: testing labs lacked validated and consistently applied procedures for defining DNA patterns from samples, for declaring whether two patterns matched within a given tolerance, and for determining the probability of such matches arising by chance in the population. When, as a result, DNA evidence was declared inadmissible in a 1989 case in New York, scientists engaged in DNA analysis in both forensic and non-forensic applications came together to promote the development of reliable principles and methods that have enabled DNA analysis of single-source samples to become the ‘gold standard’ of forensic science for both investigation and prosecution.

Once DNA analysis became a reliable methodology, the power of the technology – including its ability to analyse small samples and to distinguish between individuals – made it possible not only to identify and convict true perpetrators but also to clear wrongly accused suspects before prosecution and to re-examine a number of past convictions. Reviews by the National Institute of Justice and others have found that DNA testing during the course of investigations has cleared tens of thousands of suspects and that DNA-based re-examination of past cases has led so far to

the exonerations of 342 defendants. Independent reviews of these cases have revealed that many relied in part on faulty expert testimony from forensic scientists who had told juries incorrectly that similar features in a pair of samples taken from a suspect and from a crime scene (hair, bullets, bitemarks, tire or shoe treads, or other items) implicated defendants in a crime with a high degree of certainty.

One of the many examples supplied was this (at 3):

Starting in 2012, the Department of Justice (DOJ) and FBI undertook an unprecedented review of testimony in more than 3,000 criminal cases involving microscopic hair analysis. Their initial results, released in 2015, showed that FBI examiners had provided scientifically invalid testimony in more than 95 percent of cases where that testimony was used to inculcate a defendant at trial.

PCAST reiterated the need to evaluate specific forensic methods to determine whether they had been scientifically established to be valid and reliable. The report noted (at 122) that:

... many forensic feature-comparison methods have historically been ***assumed*** rather than ***established*** to be foundationally valid based on appropriate empirical evidence. Only within the past decade has the forensic science community begun to recognize the **need to empirically test whether specific methods meet the scientific criteria for scientific validity**.

The report concluded (at 143) that scientific validity and reliability requires that a method has been subjected to empirical testing, under conditions appropriate to its intended use. It stated that ‘without actual empirical evidence of its ability to produce conclusions at a level of accuracy appropriate to its intended use, an examiner’s conclusion that two samples were likely to have come from the same source was “scientifically meaningless”’.

Additional facts:

- The decision of the High Court in *IMM v The Queen* (2016) 257 CLR 300 was handed down on 14 April 2016. The PCAST Report followed in September of the same year.
- The findings in the NAS Report and the PCAST Report led ultimately to the establishment in the USA of the *National Commission on Forensic Science* which was tasked to provide recommendations and advice to the Department of Justice concerning national methods and strategies for: strengthening the validity and reliability of the forensic sciences; enhancing quality assurance and quality control in forensic science laboratories and units; identifying and recommending scientific guidance and protocols for evidence seizure, testing, analysis, and reporting by forensic science laboratories and units; and identifying and assessing other needs of the forensic science communities to strengthen their disciplines and meet the increasing demands generated by the criminal and civil justice systems at all levels of government. It also served as a national forum where all stakeholders could come together, establish common ground, and find solutions for policy recommendations to strengthen the criminal justice system at the federal, state and local levels.
- In 2017, the Trump administration allowed the charter for the National Commission on Forensic Science to expire. Nothing has replaced it.

- On 13 January 2021, the Department of Justice published an unsigned statement on the PCAST Report – almost five years after the event and seven days before the end of President Trump’s term – alleging that ‘the report contained several fundamentally incorrect claims’ and attempting to explain why. The arguments contained in the statement were subsequently described by the *Union of Concerned Scientists* as ‘unscientific’ and ‘dangerous’.

It might therefore be a mistake to think that the heavy lifting in this area will continue to be led by the Americans. Much will always depend on political will to allocate resources to the problem.

For an Australian example of this very thing, at a meeting of the Council of Attorneys-General (CAG) in November 2019 the Attorneys agreed to share their experiences on the use of forensic evidence in criminal trials and to review existing laws and practices. Victoria agreed to lead the work, in close consultation with relevant bodies and representatives from all interested jurisdictions, and to report back to CAG. The review’s working group intended to examine the capability of juries to understand complex evidence and whether baseline standards should be introduced in courts to restrict the use of untested or speculative expert opinions. However, the review was shelved after only 16 months in favour of other ‘national priorities’.

That said, in the United Kingdom, the Science and Technology Select Committee of the House of Lords released a report in 2019 entitled, *Forensic Science and the Criminal Justice System: A Blueprint for Change*, following a review which started in 2017. Some of the concerns raised in the report were:

- Police were increasingly relying on unregulated experts to examine samples from suspects and crime scenes and cost has become a greater factor in the tendering process rather than quality.
- Without statutory powers to enforce compliance, the Forensic Science Regulator could not ensure that science being used in the criminal justice system is being carried out to the required standard.
- The scientific evidence base for different types of forensic science was variable and, in some cases, very limited.

These concerns provided even greater impetus for the work of the Royal Society and others had been doing to educate trial judges as gatekeepers through the judicial primers project. The project commenced in 2014, and it is a collaboration between members of the judiciary, the Royal Society and the Royal Society of Edinburgh. Designed to assist the judiciary when handling scientific evidence in the courtroom, the primers have been written by leading scientists, peer reviewed by scientists and legal practitioners, and approved by the Councils of the Royal Society and the Royal Society of Edinburgh.

Each judicial primer presents an easily understood and accurate position on a scientific topic relevant to the courts. It outlines and clarifies the science underpinning the topic, highlighting its limitations and the challenges associated with its application in a judicial context. They ‘tackle the agreed and uncontroversial basis underlying scientific topics. The objective is to provide a judge with the scientific

baseline from which any expert dispute in a particular case can begin'.¹ Each primer is created under the direction of a Steering Group and is distributed to courts in conjunction with the Judicial College, the Judicial Institute and the Judicial Studies Board for Northern Ireland. To date, judicial primers have been distributed on the following topics:

- DNA analysis;
- gait analysis;
- statistics;
- ballistics;
- anthropology;
- collision investigation; and
- fire investigation.

In Australia, '[t]here has not been a systematic, independent review of the state of forensic science, and questions of reliability have only occasionally arisen for appellate consideration'.² Issues of reliability and validity of forensic evidence have been raised in some academic literature but overall they have received relatively little attention.³ If 'of more than 2,400 proven false convictions since 1989 recorded by the [US] National Registry of Exonerations, nearly 25% involved false or misleading forensic scientific evidence ... [it] would not be unreasonable to think that, whatever the percentage might be in [Australia], there have been a significant number of wrongful convictions based upon flawed evidence of that kind'.⁴

Why there has been such inertia here is difficult to fathom. After all, Australia has contributed more than its fair share of spectacular criminal justice failures due to unsound expert evidence – from the hanging of Colin Ross in the 1920s to the Chamberlains and then to David Eastman, to name a small selection.⁵

But, there have been a couple of notable exceptions.

¹ Lord Anthony Hughes, Chair of the Primers Steering Group, 'Courtroom Science Primers Launched Today', *The Royal Society* (Web Page) <<https://royalsociety.org/news/2017/11/royal-society-launches-courtroom-science-primers/>>.

² Chris Maxwell AC, 'Preventing Miscarriages of Justice: The Reliability of Forensic Evidence and the Role of the Trial Judge as Gatekeeper' (2019) 93(8) *Australian Law Journal* 642, 644.

³ Ibid. See, eg, G Edmond, 'The Admissibility of Forensic Science and Medicine Evidence under the Uniform Evidence Law' (2014) 38(3) *Criminal Law Journal* 136; G Edmond, 'What Lawyers Should Know about the Forensic Sciences' (2015) 36(1) *Adelaide Law Review* 33; G Edmond, 'Forensic Science Evidence and the Conditions for Rational (Jury) Evaluation' (2015) 39(1) *Melbourne University Law Review* 77; T Ward et al, 'Forensic Science, Scientific Validity and Reliability: Advice from America' (2017) 5 *Criminal Law Review* 357.

⁴ Mark Weinberg, 'Juries, Judges, and Junk Science – Expert Evidence on Trial' (2021) 14(4) *The Judicial Review* 315, 318.

⁵ See M Smith and G Urbas, 'A Century of Science in Australian Criminal Trials' (2019) 47(1) *Australian Bar Review* 72; D Hamer and G Edmond, 'Forensic Science Evidence, Wrongful Convictions and Adversarial Process' (2019) 38(2) *University of Queensland Law Journal* 185.

The National Institute of Forensic Science (**NIFS**) has not been idle. In that regard, in 2020, Ballantyne and Wilson-Wilde wrote that:

[The NIFS] has been working with stakeholders for a number of years to address the concerns raised in the recent reports. The size of this work is significant and currently ANZPAA NIFS is maximising its resources and funding to achieve this aim. There is, however, an increasing risk to forensic science service providers globally, where gaps have and continue to be identified, but work is protracted due to resources and non-coordinated efforts.⁶

They went on to note that the absence of empirical evidence does not necessarily imply unreliability. However, ‘until empirical studies are performed for a particular method, caution should be exercised when considering the information and opinions provided’.⁷

Also, in most Australian jurisdictions, there are codes of conduct setting out obligations for experts in writing reports. Expert witnesses must agree to be bound by such codes of conduct, and to formally acknowledge that commitment when preparing reports and testifying. According to Edmond et al, however, only ‘a small proportion of the reports produced by forensic scientists are compliant with the terms of these formal codes’.⁸

Lastly, in Victoria, the Forensic Evidence Working Group, comprising judges, forensic scientists, prosecutors and defence lawyers, developed a Practice Note, *Expert Evidence in Criminal Trials*.⁹

The Practice Note:

- contains detailed specifications of what an expert report must contain;
- establishes procedures to enable defence counsel to confer with a prosecution expert before trial;
- enables the trial judge to direct experts to confer and prepare a joint report; and
- makes provision for ‘concurrent evidence’ in a case where both prosecution and defence rely on expert evidence.¹⁰

An expert providing a report to which the Practice Note applies must state:

- any qualification of an opinion expressed in the report, without which the report would or might be incomplete or misleading;
- any limitation or uncertainty affecting the reliability of the methods or techniques used or the data relied on to arrive at the opinion(s) in the report; and
- any limitation or uncertainty affecting the reliability of the opinion(s) in the report as a result of insufficient research or insufficient data.

⁶ K Ballantyne and L Wilson-Wilde, ‘Assessing the Reliability and Validity of Forensic Science – An Industry Perspective’ (2020) 52(3) *Australian Journal of Forensic Sciences* 275, 280.

⁷ *Ibid* 277.

⁸ G Edmond et al, ‘How to Cross-Examine Forensic Scientists: A Guide for Lawyers’ (2014) 39(2) *Australian Bar Review* 174, 187.

⁹ Maxwell (n 2) 654.

¹⁰ *Ibid*.

The Law

In the NAS Report, these fundamental truths appear (at 9):

Two very important questions should underlie the law's admission of and reliance upon forensic evidence in criminal trials: (1) the extent to which a particular forensic discipline is founded on a reliable scientific methodology that gives it the capacity to accurately analyze evidence and report findings and (2) the extent to which practitioners in a particular forensic discipline rely on human interpretation that could be tainted by error, the threat of bias, or the absence of sound operational procedures and robust performance standards. These questions are significant. Thus, **it matters a great deal whether an expert is qualified to testify about forensic evidence and whether the evidence is sufficiently reliable to merit a fact finder's reliance on the truth that it purports to support.** Unfortunately, these important questions do not always produce satisfactory answers in judicial decisions pertaining to the admissibility of forensic science evidence proffered in criminal trials.

None of this is surprising. Forensic evidence must be properly founded and reliable to have any utility (probative value). Where evidence lacking these attributes is placed before a jury, or its application or limitations are not well explained or understood, the risk of miscarriage of justice is worse than merely high; rather, it is hidden and therefore largely incapable of appellate review.

Acknowledging these obvious problems, in 1993 the Supreme Court of the United States conferred upon federal judges the responsibility of acting as 'gatekeepers' for the admissibility of scientific and other forensic testimony: *Daubert v Merrell Dow Pharmaceuticals Inc.* (1993) 509 US 579. This imposed an obligation on federal judges to ensure that all scientific testimony was 'not only relevant but reliable' and expert evidence would not be admissible unless the principles and methodology underlying the expert's opinion were shown to be scientifically valid. It required 'federal judges ... to take a far more active approach to the admissibility of scientific testimony' and its 'aim was to eliminate much of so-called "junk science"'.¹¹

Factors that may be considered by the trial judge include:

- whether the theory or technique in question can be and has been tested;
- whether it has been subjected to peer review and publication;
- its known or potential error rate;
- the existence and maintenance of standards controlling its operation; and
- whether it has attracted widespread acceptance within a relevant scientific community.¹²

Rule 702 of the United States Rule of Evidence provides guidance in determining the admissibility of expert testimony, stating that an expert's opinion is admissible if:

- the expert's scientific, technical, or other specialised knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- the testimony is based on sufficient facts or data;

¹¹ Weinberg (n 4) 320.

¹² *Daubert v Merrell Dow Pharmaceuticals Inc* 509 US 579 (1993).

- the testimony is the product of reliable principles and methods; and
- the expert has reliably applied the principles and methods to the facts of the case.

In time, the Supreme Court of Canada adopted the ‘reliable foundation’ test laid down in *Daubert*. In *R v J-L J* [2000] 2 SCR 600, the court stated that:

The trial judge should take seriously the role of ‘gatekeeper’. The admissibility of the expert evidence should be scrutinised at the time it is proffered, and not allowed too easy an entry on the basis that all of the frailties could go at the end of the evidence to weight rather than admissibility.¹³

More recently, in *White Burgess Langille Inman v Abbott and Haliburton Co* [2015] 2 SCR 182, the Supreme Court of Canada observed (at [1]):

Expert opinion evidence can be a key element in the search for truth, but it may also pose special dangers. To guard against them, **the Court over the last 20 years or so has progressively tightened the rules of admissibility** and enhanced the trial judge’s gatekeeping role. These developments seek **to ensure that expert opinion evidence meets certain basic standards before it is admitted**.

New Zealand courts have also accepted that reliability must be considered when determining whether to admit scientific evidence.¹⁴ In *Lundy v The Queen* [2014] 2 NZLR 273 the Court of Appeal embraced what had been held in *R v J-L J* and added:

We consider it is axiomatic that if the fact-finder is to be helped to ascertain facts, expert opinion evidence must meet a threshold reliability. Otherwise the evidence will hinder, and potentially mislead rather than help. So the majority of this Court was clearly right when in the pre-trial appeal it identified that one purpose of what it called (with reference to *Daubert*) the ‘superadded admissibility requirements’ is to protect the jury from ‘what is sometimes colloquially called pseudo-science, meaning idiosyncratic and plainly unsatisfactory theories’.¹⁵

In the UK, the existence of a common law reliability test was confirmed by the Court of Appeal in *R v Reed* [2009] EWCA Crim 2698, at least for ‘expert evidence of a scientific nature’.¹⁶ In *R v Dlugoz* [2013] EWCA Crim 2 the court stated that ‘the court must be satisfied that there is a sufficiently reliable scientific basis for the evidence to be admitted’.¹⁷

These judicial responses of course reflect an increasing awareness of the dangers inherent in almost every species of expert evidence, and the need for trial judges to perform what is now well-accepted as a gatekeeping role to guard against miscarriages of justice.

Unfortunately, in Australia, we seem to have headed in the opposite direction and, as to that, we are largely on our own.

¹³ *R v J-L J* [2000] 2 SCR 600, 613.

¹⁴ I Freckelton, *Expert Evidence: Law, Practice, Procedure & Advocacy* (Thomson Reuters, 6th ed, 2019) [3.05.120].

¹⁵ *Lundy v The Queen* [2014] 2 NZLR 273; [2013] UKPC 28 at [72].

¹⁶ *R v Reed* [2009] EWCA Crim 2698.

¹⁷ *R v Dlugosz* [2013] EWCA Crim 2 [11].

The majority of states and territories rely upon the Uniform Evidence Law (UEL).¹⁸ Admissibility of expert opinion in other jurisdictions is governed by the common law. There is no common law or legislative requirement in Australia that expert opinion evidence must pass ‘a threshold test which can conveniently be called the minimum threshold of reliability’.¹⁹ Generally, however, the common law has not led judges to engage with reliability in a meaningful way.²⁰

Under the UEL, the question of whether reliability is a criterion of admissibility of opinion evidence has arisen under s 79(1) and under s 137 (and s 135). Intermediate appellate courts concluded that reliability of an expert opinion does not fall to be considered under s 79(1).²¹ Different approaches were, however, taken by courts in considering whether reliability is to be assessed in decisions to exclude evidence under s 135 or s 137.

Section 76 UEL provides that ‘evidence of an opinion is not admissible to prove the existence of a fact about the existence of which the opinion was expressed’. Section 79(1) is an exception to the general prohibition on opinion evidence and provides that:

If a person has specialised knowledge based on the person's training, study or experience, the opinion rule does not apply to evidence of an opinion of that person that is wholly or substantially based on that knowledge.

It follows that, to be admissible, the opinion must be wholly or substantially based on ‘specialised knowledge’, and this specialised knowledge must be based on training, study or experience.

In *Honeysett v The Queen* (2014) 253 CLR 122 the High Court discussed the meaning of ‘specialised knowledge’, drawing on what was said in *Daubert* about ‘knowledge’. The court held that s 79(1) prescribed two conditions of admissibility:

[F]irst, the witness must have ‘specialised knowledge based on the person's training, study or experience’ and, second, the opinion must be ‘wholly or substantially based on that knowledge’. The first condition directs attention to the existence of an area of ‘specialised knowledge’. ‘Specialised knowledge’ is to be distinguished from matters of ‘common knowledge’. Specialised knowledge is knowledge which is outside that of persons who have not by training, study or experience acquired an understanding of the subject matter. It may be of matters that are not of a scientific or technical kind and a person without any formal qualifications may acquire specialised knowledge by experience. However, the person's training, study or experience must result in the acquisition of knowledge. The Macquarie Dictionary defines ‘knowledge’ as ‘acquaintance with *facts, truths, or principles*, as from study or investigation’ (emphasis added) and it is in this sense that it is used in s 79(1).²²

¹⁸ NSW, Victoria, Tasmania, ACT and NT.

¹⁹ JD Heydon, LexisNexis, *Cross on Evidence* vol 1 (at Service 223) (LexisNexis) [29045].

²⁰ G Edmond, ‘Regulating Forensic Science and Medicine Evidence at Trial: It’s Time for a Wall, a Gate and Some Gatekeeping’ (2020) 94(6) *Australian Law Journal* 427, 428.

²¹ *Tuite v The Queen* (2015) 49 VR 196 [10]; *R v Tang* (2006) 65 NSWLR 681.

²² *Honeysett v The Queen* (2014) 88 ALJR 786, [23].

The court in *Honeysett* did not address the question of reliability, beyond noting that Spigelman CJ in the NSWCCA had ‘cautioned against introducing an extraneous idea such as reliability’ into the determination of admissibility under s 79(1).²³

Earlier, in *Dasreef Pty Ltd v Hawchar*, the court had said that the requirements of s 79(1) could ‘in many or most cases, be satisfied very quickly and easily... once the witness has described his or her qualifications and experience, and has identified the subject matter about which the opinion is proffered’.²⁴

The UEL provides for both mandatory and discretionary exclusion of evidence. Section 137 UEL requires the court to exclude evidence if its probative value is outweighed by the danger of unfair prejudice to the accused. Separately, under s 135 UEL evidence may be excluded if its probative value is substantially outweighed by, among other factors, the danger of unfair prejudice.

In 2015, in *Tuite v The Queen* (2015) 49 VR 196, the Victorian Court of Appeal held that reliability was not a condition of admissibility under s 79(1) but that reliability could and should be assessed by the trial judge as part of the determination of probative value under s 137²⁵ – a sensible, workable approach to the whole problem. Following *Daubert*, the court concluded that the touchstone of reliability for scientific evidence was trustworthiness, which in turn depended on scientific validity.

The Court of Appeal suggested that the focus on proven validation had a number of advantages:

First, and most importantly, it means that the scrutiny of scientific evidence in the judicial process will apply the rigour which the discipline of science itself demands. As it was put in *Daubert*, evidentiary reliability will be based on scientific validity. Secondly, the trial judge considering scientific evidence will ordinarily be able to assess the sufficiency of validation – based on the published results of validation tests – without needing to acquire particular expertise in the relevant field of science. Thirdly, validation studies provide a framework which assists the judge – and, ultimately, the jury – to evaluate the evidence. Fourthly, this approach avoids what we consider to be the unworkable imprecision of a ‘general acceptance’ test, and would ensure that new developments and novel techniques are not excluded, provided always that their scientific validity is established to the satisfaction of the court.²⁶

However, in *IMM v The Queen* (2016) 257 CLR 300, the High Court held (4:3) that the judge’s assessment of probative value under s 137 does not involve any consideration of the reliability of the evidence. In the view of the majority, the judge must proceed on the assumption that the jury will ‘accept’ the evidence. The judge should not have regard to credibility or the reliability of the evidence.

The majority said:

The *Evidence Act* contains no warrant for the application of tests of reliability or credibility in connection with ss 79(1)(b) and 137. The only occasion for a trial judge to consider the reliability of evidence, in connection with the admissibility of evidence, is provided by ss 65(2)(c) and (d)

²³ *Tuite v The Queen* (2015) 49 VR 196 [58]; *Honeysett v The Queen* (2014) 88 ALJR 786 [27].

²⁴ *Dasreef Pty Ltd v Hawchar* (2011) 243 CLR 588, [37].

²⁵ Maxwell (n 2) 642; *Tuite v The Queen* (2015) 49 VR 196, 200 [11].

²⁶ Maxwell (n 2) 649.

and 85. It is the evident policy of the Act that, generally speaking, questions as to the reliability or otherwise of evidence are matters for a jury, albeit that a jury would need to be warned by the trial judge about evidence which may be unreliable pursuant to s 165.²⁷

The majority judgment may have left open the possibility of the judge considering the reliability of opinion evidence as part of the assessment (under s 135) of the risk of unfair prejudice to the defendant,²⁸ but it would seem ‘inappropriate to leave the issue of reliability of the state’s forensic science and medicine evidence to one arm of a balancing exercise, particularly where the other arm of the balance is firmly set in favour of admission’.²⁹

The overall result is deeply concerning. As Freckelton KC put it, this ‘leaves Australia significantly out of step with cognate parts of the common law world in failing to exclude evidence which lacks key hallmarks of reliability’.³⁰ He pointed out that this contrasts with:

- the law of the United States, as set out in *Daubert v Merrell Dow Pharmaceuticals Inc* 509 US 579; 113 S Ct 2786 (1993);
- the law of Canada, as set out in *R v Mohan* [1994] 2 SCR 9; (1994) 89 CCC (3d) 402 at 21 and *R v Trochym* [2000] 1 SCR 239;
- the law of New Zealand: *Lundy v The Queen* [2018] NZCA 410; [2013] UKPC 28; [2014] 2 NZLR 273;
- the law of England and Wales, implementing *R v Dlugosz* [2013] EWCA Crim 2 by virtue of Pt 19 of the Criminal Procedure Rules 2015 and Criminal Practice Directions 2015, 19A.5; and
- the law of India: see *Chaudhary v CBI* (unreported, High Court of Delhi, 15 May 2009).

Leaving to a jury such technical questions as are bound up in any determination of the reliability of expert evidence is asking for trouble. As the PCAST Report noted:

The vast majority of jurors have no independent ability to interpret the probative value of results based on the detection, comparison, and frequency of scientific evidence. ... The potential prejudicial impact is unusually high, because jurors are likely to overestimate the probative value of a ‘match’ between samples.³¹

In a similar vein were these observations in *Tuite*:

In this extraordinary case, however, the course adopted by the defence at trial resulted in the jury spending many days listening to expert evidence which, it was evidently thought, would enable them to make a meaningful assessment of the (un)reliability of highly technical software programs. Jurors bring very great capabilities to their task, and their conscientiousness is well-recognised. It is equally well understood, however, that juries are not equipped - and cannot be expected - to evaluate complex scientific evidence. That is why it is so important that the trial

²⁷ *IMM v The Queen* (2016) 257 CLR 300, 315 [52].

²⁸ G Edmond (n 20) 435.

²⁹ *Ibid.*

³⁰ Freckelton (n 14) [2.0.10].

³¹ PCAST Report, 45; Maxwell (n 2) 643.

judge can perform the role of gatekeeper in resolving issues of scientific reliability at the threshold. As we have pointed out, Emerton J had already performed that task for the purposes of this case.³²

There is a further aspect to all of this. Not only are juries ill-equipped to evaluate complex expert evidence to determine reliability, in most cases there will be *no evidence* before them to undertake such a task. This is because the evidence will have been admitted without any consideration of its reliability and often without any challenge, which brings us to the third part of the problem.

The Imbalance

As the NAS Report made clear, the adversarial process relating to the admission and exclusion of scientific evidence is not really suited to the task of finding ‘scientific truth’:

The judicial system is encumbered by, among other things, judges and lawyers who generally lack the scientific expertise necessary to comprehend and evaluate forensic evidence in an informed manner, trial judges (sitting alone) who must decide evidentiary issues without the benefit of judicial colleagues and often with little time for extensive research and reflection.³³

Furthermore, the evidence assembled in support of the vast majority of serious crime prosecutions in Australia includes some form of forensic evidence, and yet almost every defendant to those prosecutions is legally aided. Only rarely is funding advanced to properly comprehend, test or challenge that evidence. With few exceptions, defence counsel are not equipped by training or learning to mount an effective challenge to forensic evidence without expert assistance. These resource constraints and a lack of awareness and understanding by counsel about forensic evidence and its potential limitations are productive of a marked imbalance at the bar table.³⁴

The result is that, more often than not, forensic evidence is not properly scrutinised by the defence, not properly tested in court and, in many cases, not challenged at all.

Plainly enough, if the defence do not question the scientific foundation, or reliability, of particular expert evidence, the jury have no practical alternative but to treat the evidence as reliable. In turn, the comfort usually provided by the existence of avenues of appeal becomes no comfort at all because there is no evidentiary basis to scrutinise the unchallenged expert findings presented to the jury.³⁵

Because issues of reliability are not being routinely raised or considered, it is impossible to assess the scale of unreliable evidence in Australia or its impact on verdicts.

³² *Tuite v The Queen* [2020] VSCA 318 [114].

³³ NAS Report, 110.

³⁴ G Edmond et al, ‘Forensic Science Evidence and the Limits of Cross-Examination’ (2019) 42(3) *Melbourne University Law Review* 858, 862.

³⁵ Note the exceptional course taken by the Victorian Court of Appeal in *Vinaccia v The Queen* [2022] VSCA 107, where the defence were permitted to adduce expert evidence on appeal which challenged (for the first time) the reliability of the prosecution’s expert evidence.

The program rationale

The program was designed to address this tripartite problem. With some exceptions, trial judges in Australia are not performing any sort of gatekeeping role, and this needs to change. They are the last line of defence against miscarriages of justice occasioned by the reception of invalid and/or unreliable expert evidence. Indeed, for the reasons earlier discussed, they may be the only real line of defence.

The program will bring together experienced judges and scientists to share knowledge, skills and experiences with a view to raising awareness of the importance of the gatekeeping role and educate judges on modern scientific perspectives bearing on the admission, use and evaluation of expert evidence. The focus is not just on knowledge, but also on court craft skills pertaining to the admission and discretionary exclusion of expert evidence, which are available to a trial judge.



Learning objectives

By the end of this program, participants will:

- have an increased awareness of the fallibility of most species of forensic evidence and especially expert comparison evidence
- be able to identify the means available to the trial judge to intervene so as to investigate the reliability of that evidence;
- have developed confidence to act as gatekeepers;
- be equipped to adopt a range of strategies to that end;
- be better able to understand questions that go to the foundation and reliability of expert evidence;
- be equipped with resources from other jurisdictions currently available to trial judges in relation to commonly encountered forms of forensic evidence; and
- be able to return to their home jurisdictions to pass on the knowledge and skills acquired during the program and, in doing so, spread the gatekeeping message.

Two strands

The program approaches the problem in two strands: first, an exploration of the scope for judicial intervention and, second, education.

Presenters and facilitators

Chris Maxwell AC	Former President of the Victorian Court of Appeal
Mark Weinberg AO	Former judge of the Victorian Court of Appeal
Glenn Martin AM	Senior Judge Administrator, Supreme Court of Queensland
Martin Burns	Judge, Supreme Court of Queensland
Tony Rafter SC	Judge, District Court of Queensland
Graham Turnbull SC	Judge, District Court of New south Wales
Kara Shead SC	Judge, District Court of New South Wales
Dr Kaye Ballantyne	Chief Forensic Scientist, Victoria Police Forensic Services Department
Andrew Kirkham AM RFD KC	Barrister, Victorian Bar
Kate Latimer	CEO, National Judicial College of Australia
Jessica Southwell	Forensic Training Team, Operational Science and Technology, Australian Federal Police
Prof Jane Goodman-Delahunty	School of Law and Justice, University of Newcastle

Pre-program survey

To be circulated on **Friday, 28 July 2023** and completed by **Thursday, 3 August 2023**:

1. How many years of experience do you have as a trial judge or magistrate?
2. Are you from a jurisdiction governed by the *Uniform Evidence Law* of the common law?
3. Without doing any research – so, just off the top of your head – please indicate whether you believe any of the following forms of commonly-encountered expert comparison evidence can sometimes produce unreliable results:
 - (a) fingerprints;
 - (b) mitochondrial DNA;
 - (c) nuclear DNA;

- (d) voice identification;
 - (e) handwriting analysis;
 - (f) ballistics.
4. How many cases involving forensic evidence have you presided over in the past year?
 5. On a scale of 1-10, how confident do you feel in your understanding of forensic evidence and its potential limitations?
 6. Have you received any specific training or education on forensic evidence and its admissibility in court?
 7. How often do you (or juries over which you preside) rely on expert testimony regarding forensic evidence to decide a case?
 8. How frequently do you encounter challenges or objections related to the admissibility of forensic evidence during trial proceedings?
 9. How comfortable are you in evaluating the reliability of forensic evidence presented in court?
 10. Are you aware of any specific legal principles that govern the admissibility or discretionary exclusion of forensic evidence in your jurisdiction? If yes, please specify.
 11. Have you ever excluded or limited the use of forensic evidence in a case due to concerns regarding its reliability or relevance? If yes, please provide an example.
 12. What resources or support do you believe would be helpful in enhancing your ability to evaluate and make decisions regarding forensic evidence in court?

It will be important for the survey to be sent out on time with a request that it be completed by the following Friday because, on that date, the pre-reading will be sent to the participants.

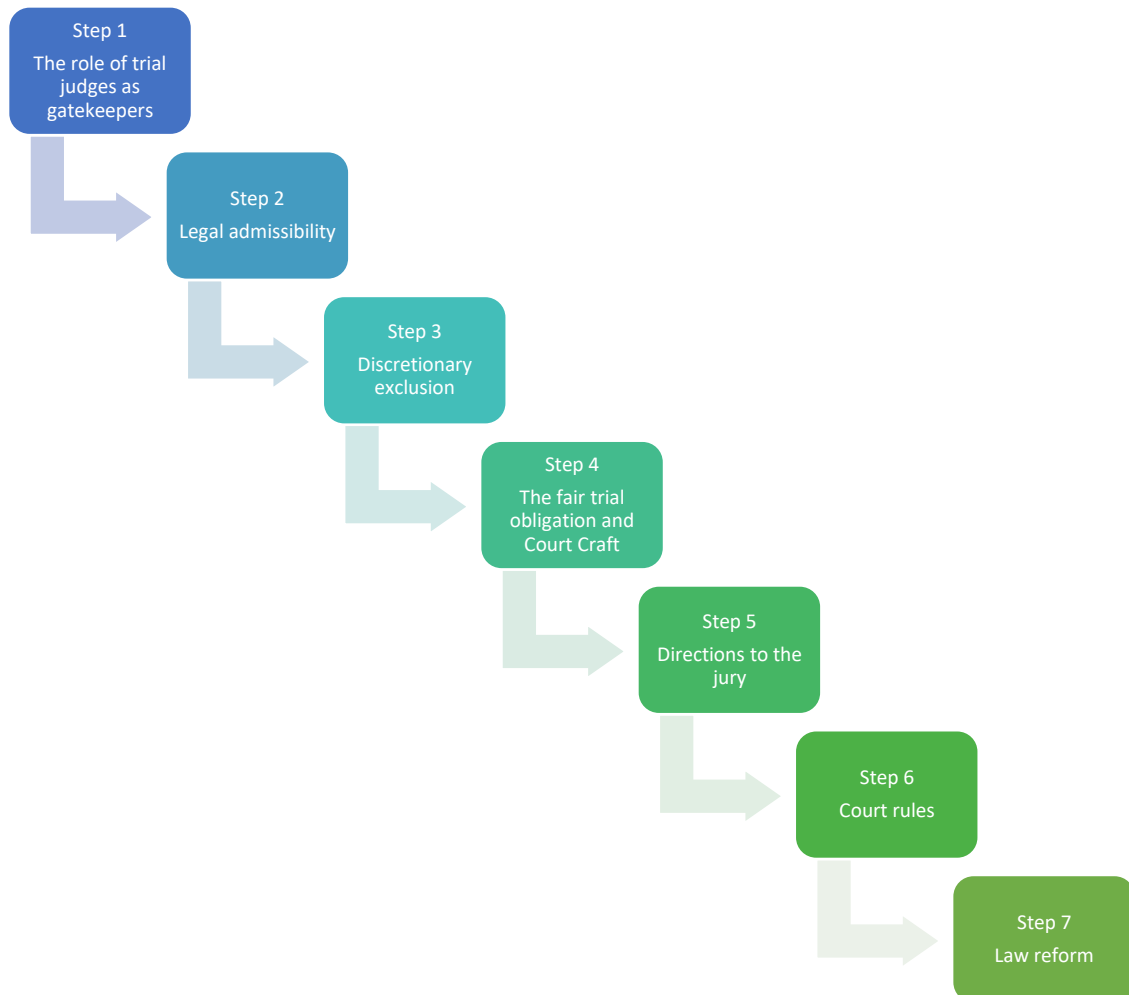
Pre-reading

Participants should be asked to read the following in advance of the program:

- *IMM v The Queen* (2016) 257 CLR 300.
- Chris Maxwell, 'Preventing Miscarriages of Justice: The Reliability of Forensic Evidence and the Role of the Trial Judge as Gatekeeper' (2019) 93(8) *Australian Law Journal* 642-654.
- M Smith and G Urbas, 'A Century of Science in Australian Criminal Trials' (2019) 47(1) *Australian Bar Review* 72-85.
- Mark Weinberg, 'Juries, Judges, and Junk Science – Expert Evidence on Trial' (2021) 14(4) *The Judicial Review* 315-342.

A PDF copy of this material should be emailed by the College to each participant on **Friday, 4 August 2023**. A copy should also be expressly referenced in the Program and Participant Guide (with the desirability of reading each in advance emphasised) and uploaded to the online portal.

The First Strand: A Solution Over Seven Steps



Step 1 – The role of trial judges as gatekeepers

Content

The first step in this exploration of the scope for judicial intervention is acceptance of the proposition that trial judges have a critical role to play in the trial process as final stage evidentiary filters. This was of course the theme of Chris' article – 'Preventing Miscarriages of Justice: The Reliability of Forensic Evidence and the Role of the Trial Judge as Gatekeeper' (2019) 93(8) *Australian Law Journal* 642-654 – so Chris will speak to that (and each of the participants should have read it in advance).

Delivery

This component will be delivered by **Chris Maxwell** AC in his keynote address [**Session 2**] and emphasised throughout the balance of the program.

Step 2 – Legal admissibility

Content

The second step is an understanding of the state of the current law (under the UEL and the common law) governing the admissibility of forensic evidence, the reliability of which has not been demonstrated.

Delivery

Mark Weinberg will be asked to deliver this component in conjunction with **Tony Rafter** in **Session 3**.

Tony to introduce Mark, and Mark to then speak to his article – ‘Juries, Judges, and Junk Science – Expert Evidence on Trial’ (2021) 14(4) *The Judicial Review* 315-342. Again, the participants should have read that in advance. Suggest 20 to 30 minutes.

Tony should assist where necessary on the common law position.

The balance of the session should be devoted to a panel discussion and Q & A led by Mark and including other judge presenters/facilitators, but especially **Chris Maxwell**. This will need to be firmed up between Mark and Tony (and Chris).

Step 3 – Discretionary exclusion

Content

As with the legal admissibility question, the limitations on the gatekeeping role because of the state of the current law governing discretionary exclusion – discussed earlier – will be explained.

Delivery

This topic of course goes hand-in-hand with legal admissibility and will be delivered as part of **Session 3**. **Mark Weinberg** will be asked to deliver this component in conjunction with **Tony Rafter** in the format summarised above.

Step 4 – The fair trial obligation and court craft

Content

The fundamental task of a trial judge is to ensure a fair trial of the accused.³⁶ Relevantly, a judge presiding over a criminal trial always has a discretion to exclude evidence if the strict rules of admissibility would operate unfairly against the accused.³⁷ Whatever the state of the law under the UEL, this is a separate and distinct obligation and arises under the common law, and the categories of cases in which the discretion may be enlivened is not closed.

The UEL is not a code: s 9(1) UEL. Importantly, in *Haddara v R* (2014) 43 VR 53; [2014] VSCA 100, Redlich and Weinberg JJA (Priest JA dissenting) held that the common law power to exclude evidence to ensure a fair trial survived the introduction of the *Evidence Act 2008*, on the basis that the exclusionary rules in Chapter 3 are not a complete code. At [70] to [72], their Honours said:

“On careful analysis, those cases which suggest that the Act is a code are authority only for the proposition that the exclusionary provision under the Act with which each of those cases was concerned related to a specific area in which a common law discretion had previously operated. Thus it may now be said that s 137 replaces the *Christie* discretion, s 90 replaces the *Lee* discretion and 138 replaces the *Bunning v Cross* and *Ridgeway* discretion. Beyond that, neither authority or principle constrains us to conclude that the Act precludes the application of the general common law discretion.

We are fortified in our views by the extra-curial observations of Justice Heydon in his article ‘The Non-Uniformity of the “Uniform” Evidence Acts and Their Effect on the General Law’. He said of s 56 of the Act that the words ‘except as otherwise provided by this Act’ appear to apply only to the legislative provisions dealing with the rejection of relevant evidence so that courts are deprived of the power to develop new rules for the exclusion of relevant evidence. He rejected the wider view of s 56 expressed in *McNeill* that Chapter 3 is ‘intended to cover the field in relation to the admissibility of relevant evidence’. He referred to the principle of legality that ‘it is in the last degree improbable that the legislature would overthrow fundamental principles, infringe rights, or depart from the general system of law, without expressing its intention with irresistible clearness’ as a principled argument for the view that common law rules do survive various parts of the Act as a matter of statutory construction. Justice Heydon identified

³⁶ *Pemble v The Queen* (1971) 124 CLR 107, 117; *RPS v The Queen* (2000) 199 CLR 620, [41]; *McKell v The Queen* (2019) 264 CLR 307, [2].

³⁷ *Myers v Director of Public Prosecutions* [1965] AC 101, 1024; *Driscoll v The Queen* (1977) 137 CLR 517, 541; *R v Sang* [1980] AC 402, 444-445; *Bunning v Cross* (1978) 141 CLR 54, 73-74; *Stephens v The Queen* (1985) 156 CLR 664, 669.

fundamental principles of fairness that were likely to continue. One such rule was ‘a general common law rule’ permitting the court to exclude evidence if its reception would deny the accused a fair trial. He said that rule ‘may operate more widely than the avenues for exclusion in ss 135 and 137’. Another example was the rule in *Browne v Dunn* which has been held to continue to exist despite the Act. In his article, Justice Heydon concluded that where the court is considering whether a provision of the Act reflects previous law or changes it, or where it is assessing whether a gap exists in which the previous law survives, ‘in all these enterprises the previous law will inevitably exert an influence’.

Before leaving this question, we should refer to the observations of Gaudron J in *Dietrich* which we have set out and which were referred to in *Dupas v The Queen*. They suggest that the requirement of fairness transcends the requirement that the trial be ‘conducted strictly in accordance with law’ and is a requirement capable of impinging on evidentiary and procedural rules.^[205] Whether these principles are beyond the reach of statute law to modify or abolish, or at least require an explicit and unmistakable legislative intent to do so, we do not stay to consider, but it may be that if the requirements of fairness can be traced to implicit guarantees in Chapter III of the Constitution, as her Honour suggests, any attempt to exclude the power of a judge to remedy unfairness by excluding evidence may also founder on constitutional grounds.”
[Footnotes omitted]

And see *R v Edelsten* (1990) 21 NSWLR 542, 554; *R v McLean; Ex parte AttorneyGeneral* [1991] 1 Qd R 231, 236-240; *Rozenes v Beljajev* [1995] 1 VR 533, [549].

The position under the Queensland *Evidence Act 1977* is even clearer: s 130.

More generally, judges play the central role in ensuring the fairness of trials, and have inherent powers to ensure a trial is run fairly. In *Dietrich v The Queen*, Gaudron J said that the ‘requirement of fairness is not only independent, it is intrinsic and inherent’:

“Every judge in every criminal trial has all powers necessary or expedient to prevent unfairness in the trial. Of course, particular powers serving the same end may be conferred by statute or confirmed by rules of court.”³⁸

In *X7 v Australian Crime Commission*, French CJ and Crennan J said:

“The courts have long had inherent powers to ensure that court processes are not abused. Such powers exist to enable courts to ensure that their processes are not used in a manner giving rise to injustice, thereby safeguarding the administration of justice. The power to prevent an abuse of process is an incident of the general power to ensure fairness.”³⁹

And see R Ananian-Welsh ‘*The Inherent Jurisdiction of Courts and the Fair Trial*’ (2019) 41(4) *Sydney Law Review* 423.

³⁸ *Dietrich v The Queen* (1992) 177 CLR 292, 363–4.

³⁹ *X7 v Australian Crime Commission* (2013) 248 CLR 92, [38].

Delivery

This component will be delivered during **Session 5 – Practical Justice**. It will be a panel session chaired by **Glenn Martin**, with **Martin Burns**, **Graham Turnbull** and **Tony Rafter** as panel members.

The idea is to provide a forum to explain and discuss strategies for effective gatekeeping.

Necessarily, this session will touch on aspects already discussed concerning the admissibility and discretionary exclusion of expert evidence but will emphasise the separate obligation to intervene in the interests of ensuring that an accused person receives a fair trial.

Different scenarios will be pitched and discussed.

Furthermore, the means by which the reliability of proposed evidence is determined – by *voir dire*, a *Daubert*-style hearing, by concurrent evidence or by court-appointed expert – will be discussed.

Step 5 – Directions to the jury

Content

What if all else fails and the evidence goes to the jury?

What do you tell the jury about that evidence, and when should you do it?

How can you give adequate directions to the jury about forensic evidence, the reliability of which has not been demonstrated?

It is therefore incumbent on a trial judge to explore the question of reliability when the evidence is presented (or beforehand) so as to provide a basis for an adequate charge to the jury in this regard.

Alternatively, if the evidence has gone in but its reliability has not been demonstrated, the jury should be told that very thing: *Mahmood v State of WA* (2008) 232 CLR 397 at [16]. Such a direction may contain warnings or caution the jury about the care needed in assessing that evidence or about how it can be used. A warning may be given (where there is a jury and a party so requests) in relation to evidence ‘of a kind that may be unreliable’ (s 165(1) UEL) ie evidence of a kind that the courts have acquired a special knowledge about: *R v Stewart* (2001) 52 NSWLR 301 at [86]. Indeed, s 165(5) preserves the power of a judge to give a warning or to inform the jury about a matter arising from the evidence, whether or not a warning is requested under s 165(2): *R v Stewart* at [86].

A direction or warning is not the same as a comment and generally a comment will be inadequate if a warning or direction is required. It should be given at the time the evidence is called before the jury. If the evidence is very prominent in the trial it may be appropriate to give the direction or warning immediately after the opening addresses, and then repeated in the summing up.

The clear obligation on trial judges to do so will be emphasised. This does not transgress *McKell v The Queen* (2019) 264 CLR 307.

Delivery

This will be part of **Session 5**.

A 'model' direction to the jury on the question of reliability should be drafted for discussion.

Step 6 – Court-made rules

Content

In its 2011 report, the UK Law Commission expressed the view that 'the reliability requirement in the common law admissibility test was insufficiently robust'.⁴⁰ The Commission recommended a statutory admissibility test: an expert's opinion evidence would be admissible in criminal proceedings only if it was 'sufficiently reliable to be admitted'.⁴¹ The Commission also recommended guidelines to help trial judges apply the test: one set of guidelines for expert evidence of a scientific nature, and a separate set for experience-based expert evidence.⁴²

So far, a statutory reliability test has not been introduced in the UK, but authoritative guidance is nonetheless provided via a Criminal Practice Direction made pursuant to the Criminal Procedure Rules.

The Practice Direction adopted the recommendation of the Law Commission in listing factors which the court may take into account in determining the reliability of expert opinion evidence, as follows:

- the extent and quality of the data on which the expert's opinion is based, and the validity of the methods by which they were obtained;
- if the expert's opinion relies on an inference from any findings, whether the opinion properly explains how safe or unsafe the inference is (whether by reference to statistical significance or in other appropriate terms);
- if the expert's opinion relies on the results of the use of any method (for instance, a test, measurement or survey), whether the opinion takes proper account of matters, such as the degree of precision or margin of uncertainty, affecting the accuracy or reliability of those results;
- the extent to which any material upon which the expert's opinion is based has been reviewed by others with relevant expertise (for instance, in peer-reviewed publications), and the views of those others on that material;
- the extent to which the expert's opinion is based on material falling outside the expert's own field of expertise;

⁴⁰ Law Commission, *Expert Evidence in Criminal Proceedings in England and Wales*, (Report No 325, 21 March 2011) 16 [2.14]-[2.16].

⁴¹ *Ibid* [3.36].

⁴² *Ibid* [3.40].

- the completeness of the information which was available to the expert, and whether the expert took account of all relevant information in arriving at the opinion (including information as to the context of any facts to which the opinion relates);
- if there is a range of expert opinion on the matter in question, where in the range the expert's own opinion lies and whether the expert's preference has been properly explained; and
- whether the expert's methods followed established practice in the field and, if they did not, whether the reason for the divergence has been properly explained.⁴³

The Practice Direction also provides that in considering reliability, and especially the reliability of expert scientific opinions, the court should be astute to identify potential flaws in such opinion which detract from its reliability, such as:

- being based on a hypothesis which has not been subjected to sufficient scrutiny (including, where appropriate, experimental or other testing), or which has failed to stand up to scrutiny;
- being based on an unjustifiable assumption;
- being based on flawed data;
- relying on an examination, technique, method or process which was not properly carried out or applied, or was not appropriate for use in the particular case; or
- relying on an inference or conclusion which has not been properly reached.⁴⁴

In Victoria, the Practice Note developed by the Forensic Evidence Working Group in 2014 requires an expert's report to identify 'any limitation or uncertainty' affecting the reliability of the expert's opinion or the method used or the data relied on.

Delivery

This step, along with the next, will be presented in **Session 11 – Law Reform and Judicial Leadership**.

It will be delivered by **Chris Maxwell** and **Kaye Ballantyne**.

Step 7 – Law reform

Content

Almost all academic writing on the problem about which we are concerned concludes with a plea for legislative reform through amendment of the UEL (at least). That, of course, is the ultimate solution, at least so far as the UEL is concerned.

The amendment of s 79 to make reliability a condition of the admissibility of expert evidence, and to authorise the trial judge to make a threshold assessment of reliability, would be straight-forward and

⁴³ Criminal Practice Directions CPD V Evidence 19A Expert Evidence, 19A.5.

⁴⁴ Ibid 19A.6.

this would be consistent with the recommendations of the UK Law Commission.

However, in 2005, a joint report of the Australian, New South Wales and Victorian Law Reform Commissions recommended against the introduction of a ‘*Daubert*-style’ reliability threshold in the UEL because, it was said, this might cause useful and reliable evidence to be excluded’.

Much has happened since then in what may now be described as a dramatically increased global awareness of the danger of injustice caused by the admission of unreliable expert evidence. The NAS Report was published in 2009 and the PCAST Report in 2016. Jurisdictions around the world have reacted accordingly. There can no longer be any proper justification for the passive position adopted in Australia and, more than that, good reason to act to overcome the substantial limitations placed on the gatekeeping role by the decision of the High Court in *IMM v The Queen*.

Amendments to ss 78, 135 and 137 UEL should also be considered.

Delivery

This step, along with the next, will be presented in **Session 11 – Law Reform and Judicial Leadership**, to be delivered by **Chris Maxwell** and **Kaye Ballantyne**.

It is important to note that the President of the Queensland Law Reform Commission, Fleur Kingham, will be attending the program as a participant as well as (we hope) a representative from the Australian Law Reform Commission.

The Second Strand: Education

The program is not designed to provide a forensic science education for the judges. Rather, it is intended to alert the judges to the problems with almost every type of comparison evidence, to equip them with the knowledge necessary to call upon the prosecution to demonstrate the reliability of that evidence (if not to evaluate that evidence) and to put them in touch with the range of resources to assist in these respects.

Case studies

Two case studies will be presented during the program: one actual and the other theoretical.

Content

The **actual case study** will concern the Chamberlain case.

The **theoretical case study – A Murder Most Foul** – will commence with a visit to a reconstructed crime scene on the first morning of the program, as follows:

- A deceased female is found under a pier/submerged and caught on a retaining wall at 7am by a jogger
- Body is fully clothed in jeans and shirt; no shoes. No personal effects (keys, phone etc)
- No rigor or livor mortis is present; some fish/crustacean/lice predation is present on the areas of exposed skin
- Skin is wrinkled, consistent with submersion. No adipocere formation. No decomposition
- Defensive wounds are present on hands and lower arms
- Circular bruising present on upper left arm
- Marking around neck with minimal bruising
- Several stab wounds visible in torso; no bloodstaining on shirt

Initial Evidence

- Luminol conducted on pier – positive, diffuse reaction indicating the possible presence of blood
- No indications of disturbed vegetation/scuff marks indicating a struggle. No shoeprints visible
- A forensic odontologist who attended the scene and examined the body concluded that the bruising on the upper left arm was a bite mark, inflicted with significant force. Based on the size of the mark it was concluded that it was likely to be a male. Fractured incisal angles on the maxillary incisors, rotation of the lower incisors and deviation of the midline suggested that the individual responsible had a unique dentition, likely with protruding front lower teeth.
- A CCTV camera is located ~100m away from the pier. The camera is ~5 years old, but is pointed towards the pier. Initial review of the footage detects two individuals fighting at ~10:30pm the night before, followed by a splash and one individual running away
- A detective reviewing the footage, and combined with the bite mark information, recognised the clothing worn as similar to that commonly worn by a local drug dealer, Albert Osborne. Osborne has protruding lower teeth with a misaligned central tooth.

Expert Evidence

- The forensic odontologist compares a cast of Osborne's teeth with the bite mark. He concludes that there are 26 points of comparison, and all points matched between the bite mark and the suspect's teeth. He provides an opinion that to a reasonable degree of certainty Albert Osborne is the individual who left the bite mark on the victim.
- The report contains a long list of the odontologist's qualifications, and gives numbers of cases he has presented each level of court (e.g. Supreme, District/County and Magistrates).
- A biometrician analyses the CCTV footage, and compares it to footage taken of Albert Osborne walking down a corridor at the local police station.
- Gait analysis is the analysis, comparison and evaluation of features of human gait to assist in the identification of individuals. Each individual is thought to have a unique gait cycle, with analysis conducted independently and separately on the questioned CCTV footage and the known footage to determine the characteristics of the cycle: initial contact, loading response, mid-stance, terminal stance, pre-swing, initial swing, mid-swing and terminal swing. The comparison uses methodology common across many forensic disciplines (ACE-V). Computer models were used to extract the features of the gait in each video and to determine a match

score. In this case, the match score was 98, providing strong scientific support that the individuals in the two videos were one and the same.

- Photogrammetric height estimation was performed by the same analyst, where the height of the individual on the CCTV footage was estimated against the height of known landmarks within the footage. It was estimated that the individual was 177-178cm tall, corresponding to Albert Osborne's known height of 179cm.
- A pathologist examines the stab wounds in the victim's torso, and concludes that they were caused by a 20cm non-serrated blade with a width of 1.9cm. A knife matching this description is found at Osborne's share house.
- A crime scene examiner provides a report detailing the positive reaction of luminol at the scene, indicating that "A positive reaction was observed to a presumptive test for blood at the scene. This test can indicate the possible presence of blood staining". No DNA tests were performed.
- No DNA or fingerprints were recovered from the victim's body or clothing, though prints were found on the handrail. A sexual assault examination was negative.

Delivery

The actual case study will be delivered in **Session 7 – A Failure of Courage** when **Martin Burns** will interview **Andrew Kirkham AM RFD KC** who appeared with the late John Phillips AC QC, for Lindy and Michael Chamberlain.

The theoretical case study case will be referred to across many sessions – the CSI effect [**Session 8**] for example will discuss the forensic capability to provide time of death, a well-worn trope of crime shows. During the visit to the reconstructed crime scene on the first morning, **Kaye Ballantyne** and **Jess Southwall** will discuss in situ the various forensic tests undertaken at the crime scene.

In **Session 4**, **Kara Shead**, **Kaye Ballantyne** and **Jess Southwall** will present these tests to the participants – covering height estimation, blood samples, fingerprints, possible murder weapon, DNA, gait and bite analysis, for discussion on validity and admissibility.

In **Session 6**: the participants will be presented with reports on a new and complex forensic test to apply the courtcraft skills presented in **Session 5 – Practical Justice**.

Evaluating expert evidence

Content

The PCAST Report was concerned with feature comparison methods, that is, 'methods that seek to determine whether an evidentiary sample (eg from a crime scene) is or is not associated with a source sample (eg from a suspect) based on similar features'. The committee reviewed empirical evidence relating to the two key aspects of validity: **foundational validity** (ie whether the method is, in principle, reliable) and **validity as applied** (ie whether the method has been reliably applied in practice). For a

method to be scientifically valid and reliable, the procedures that comprise it must be shown, based on empirical studies, to be **repeatable, reproducible and accurate**, at levels that have been measured and are appropriate to the intended application.

An understanding of the role and significance of the:

- National Institute of Forensic Science (**NIFS**);
- National Association of Testing Authorities (**NATA**);
- Australian Academy of Forensic Sciences; and
- Government forensic service providers (eg the Victorian Institute of Forensic Medicine);

should be conveyed in this session.

Delivery

Incorporating the PCAST methods, **Session 8 – Evaluating expert evidence** will include a presentation from **Kaye Ballantyne** on ‘Science and what it looks like from a science perspective’, then **Kara Shead** to present on ‘Science and what it looks like from a judicial perspective’

Better understanding the impact on juries – the CSI effect

Content

If forensic evidence, the reliability of which has not been satisfactorily demonstrated, makes its way to the jury room, the evidence will be given more weight than it deserves – this is the so-called ‘white coat effect’ or ‘CSI effect’.

In *R v DD*, the Supreme Court of Canada said:

Dressed up in scientific language which the jury does not easily understand and submitted through a witness of impressive antecedents, this evidence is apt to be accepted by the jury as being virtually infallible and as having more weight than it deserves.⁴⁵

Delivery

In **Session 9, Prof Jane Goodman-Delahunty**, will discuss the predisposition of juries to attribute undeserved legitimacy to forensic evidence by reference to contemporary international and Australian research.

⁴⁵ *R v DD* [2000] SCR 275, [53]; *R v Mohan* [1994] s SCR 9, [27]; Freckelton (n 14) [12.0.100].

Increasing our knowledge base

Content

The NAS Report recognised that ‘the judicial system is encumbered by, among other things, judges and lawyers who generally lack the scientific expertise necessary to comprehend and evaluate forensic evidence in an informed manner’ (at 12), particularly regarding ‘the approaches employed by different forensic science disciplines and the reliability of forensic science evidence that is offered in trial’ (at 27). Judges need to be better educated in forensic science methodologies and practices and one of the recommendations was for ‘judicial education organizations’ to establish continuing legal education programs to that end (Recommendation 10, p 28).

In an Australian survey, approximately half of the judges and magistrates said they had encountered evidence which they had not been able to evaluate adequately because of its complexity. Of those answering the question, 17% of judges and 13% of magistrates said that the evidence in question had been scientific. Scientific evidence ranked third, behind psychiatry and psychology, in terms of difficulty of comprehension among judges primarily sitting in the criminal area.⁴⁶

In this session, there will be a discussion of the approach taken by the Royal Society and similar initiatives.

Additionally, useful and readily sources of information will be identified and made available to participants such as the PCAST Report, the NAS Report, the Royal Society primers, the *Science Manual for Canadian Judges*, the Forensic Science Regulatory (UK) guidelines, the National Institute for Standards and Technology report (2012) and the *American Association for the Advancement of Science* report (2017).

Delivery

Martin Burns will deliver this component in **Session 10 – Educating ourselves – how much and how far?**

Participants will be provided with a copy of each of the downloadable resources on a thumb-drive.

⁴⁶ Freckelton (n 14) [12.0.60].

Wrapping up and moving forward

Consolidation

The final session [**Session 12**] will be chaired by Chris Maxwell. It will consist of a guided discussion to draw together the threads woven through the program culminating in a return to the theoretical case study with some final revelations.

Spreading the word

One of the objects of the program is to equip participants to return to their home jurisdictions to pass on what they have learned. The ways in which this might be achieved will be explored in the final session.

Review

Post-program survey and focus group review within 12 months.

Appendix – The Program

We, the Gatekeepers

10-11 August 2023 | H.C Coombs Centre, Sydney

Day 1: Thursday 10 August 2023 H.C. Coombs Centre: Level 1 Lecture Room			
	SESSION	CHAIR & PRESENTERS	DESCRIPTION
8.30am	Registration at Sydney Harbour	Ms Kate Latimer, <i>CEO, National Judicial College of Australia</i>	Registration, with a twist.
9.30am	Session 1: Welcome	Justice Martin Burns, <i>Supreme Court of Queensland</i>	An overview of the learning objectives of the program together with an outline of the sessions to come and the issues to be explored.
9.45am	Session 2: Preventing Miscarriages of Justice: The Role of the Trial Judge as Gatekeeper	The Honourable Chris Maxwell AC, <i>former President of the Court of Appeal of Victoria</i>	This keynote address will focus on the duty of trial judges to safeguard against the reception of inadmissible/unreliable expert evidence.
10.15am	Morning break		
10.45am	Session 3: The admissibility landscape in Australia	Chaired by Judge Tony Rafter KC, <i>District Court of Queensland</i> Panel discussion and Q & A led by the Honourable Mark Weinberg AO FAAL KC, <i>former Commonwealth Director of Public Prosecutions, judge of the Federal Court of Australia and judge of the Court of Appeal of Victoria</i>	An exploration of the current position under the Uniform Evidence Law and common law regarding the admissibility and discretionary exclusion of expert evidence in light of the decision of the High Court in <i>IMM v The Queen</i> (2016) 257 CLR 300.

11.45am	Session 4: Murder Most Foul: A Theoretical Case Study	<p>Judge Kara Shead SC, <i>District Court of New South Wales</i></p> <p>Dr Kaye Ballantyne, <i>Chief Forensic Scientist, Victoria Police Forensic Services Department</i></p> <p>Ms Jessica Southwell, <i>Forensic Training Team, Operational Science and Technology, Australian Federal Police</i></p>	<p>This interactive session will deliver the case scenario to be explored during the program involving a mix of expert opinion. Participants will then break out into smaller groups with facilitators to discuss the admissibility and reliability of the various categories of expert evidence. When the participants re-convene, the group conclusions will be examined by the panel followed by a Q and A.</p>
12.45pm	Lunch break		
1.45pm	Session 5: Practical Justice	<p>Chaired by Justice Glenn Martin, <i>Senior Judge Administrator, Supreme Court of Queensland</i></p> <p>Justice Martin Burns, <i>Supreme Court of Queensland</i></p> <p>Judge Tony Rafter KC, <i>District Court of Queensland</i></p> <p>Judge Graham Turnbull SC, <i>District Court of New South Wales</i></p>	<p>The obligation to ensure, as far as possible, a fair trial is fundamental to the rule of law. But, how to go about doing it? This session will focus on strategies for judicial intervention along with directions regarding the presentation of expert evidence and jury warnings.</p>
2.45pm	Session 6: Return to the Case	<p>An interactive small group session to revisit the case study – including further complications.</p> <p>Dr Kaye Ballantyne, <i>Chief Forensic Scientist, Victoria Police Forensic Services Department</i></p> <p>Judge Kara Shead SC, <i>District Court of New South Wales</i></p> <p>Ms Jessica Southwell, <i>Forensic Training Team, Operational Science and Technology, Australian Federal Police</i></p>	
3.00pm	Afternoon stretch break		
3.15pm	Session 7: A Failure of Courage	<p>Chaired by Justice Martin Burns, <i>Supreme Court of Queensland</i></p> <p>Special Guest</p>	<p>A look back at one of greatest miscarriages of justice in Australia’s legal history, and the role played by experts, the critical failings of their evidence and the attempts by the trial judge to minimise the prejudice occasioned to the accused.</p>
4.45pm	Day 1 - Program Close		
6.00pm	Drinks and Dinner – H.C. Coombs Centre: Level 4 Dining Room		

Day 2: Friday 11 August 2023		
SESSION	CHAIR & PRESENTERS	DESCRIPTION
8.30am	Tea and coffee available	
9.00am	Session 8: Evaluating expert evidence Judge Kara Shead SC, <i>District Court of New South Wales</i> Dr Kaye Ballantyne, <i>Chief Forensic Scientist, Victoria</i>	What are the hallmarks of “validation”, “accuracy” and “reliability”? Which limitations, uncertainties or controversies abound in the proper evaluation of expert evidence? This session will be followed by a workshop in smaller groups to consider a variety of case scenarios. The groups will then re-convene to discuss their respective findings and conclusions.
10.30am	Morning break	
11.00am	Session 9: The CSI Effect Chaired by Judge Graham Turnbull SC, <i>District Court of New South Wales</i> Professor Jane Goodman–Delahunty, <i>University of Newcastle, School of Law and Justice</i>	The CSI effect (or white coat syndrome) is a real phenomenon. The predisposition of juries to attribute undeserved legitimacy to forensic evidence will be highlighted in this session by reference to several studies conducted by the speaker, Professor Goodman-Delahunty.
12 noon	Lunch break	
1.00pm	Session 10: Educating ourselves – how much and how far? Justice Martin Burns, <i>Supreme Court of Queensland</i>	Discussion of the approach taken by the Royal Society and initiatives such as the Forensic Evidence Working Group and the Science Manual for Canadian Judges.

1:30pm	Session 11: Law Reform and Judicial Leadership	<p>Chaired by The Honourable Chris Maxwell AC, <i>former President of the Victorian Court of Appeal</i></p> <p>Dr Kaye Ballantyne, <i>Chief Forensic Scientist, Victoria</i></p>	This session will explore opportunities for law reform through court-made rules and the much sought-after amendment of the Uniform Evidence Law.
2:15pm	Session 12: Empowering gatekeepers: Judicial strategies for action	Chaired by The Honourable Chris Maxwell AC, <i>former President of the Victorian Court of Appeal</i>	A guided discussion drawing together the threads woven through the program culminating in a return to the opening case study, with some final revelations.
3:15pm	<p>Final remarks</p> <p>Justice Martin Burns, <i>Supreme Court of Queensland</i></p>		
3:30pm	Program Close		

A short survey will be emailed to participants at the conclusion of the program. We hope that you will complete this survey and provide feedback to help inform future program design.