

Use of penile plethysmography in the court: A review of practices in Canada, the United Kingdom and the United States

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Penile plethysmography (PPG) is an objective measure of male sexual arousal in response to the presentation of a series of erotic and neutral stimuli. This measure is now widely recognized as the most reliable means of objectively measuring male sexual arousal to specific stimuli. Many clinicians and researchers consider PPG to be a vital contribution to the assessment and treatment of adult men with paraphilic interests and men who have committed sex crimes. PPG contributes to the clinical assessment of paraphilic interests, appraisal of risk of recidivism, and provides an objective measurement of changes in sexual arousal in response to treatment. There is strong support for the utility of PPG within clinical and legal contexts. This article addresses ways in which PPG has been utilized in the courts as part of expert clinical opinion. History of its use, details regarding admissibility in court, and case law are explored within the legal systems of Canada, the UK and the USA. Support for the inclusion of PPG as expert evidence is provided and judicial misunderstandings on the rationale for PPG use and its clinical utility in forensic assessments are discussed.

1 | INTRODUCTION

Data on the objective measurement of the correlates of sexual arousal via physiological responses to stimuli depicting sexual interactions between adults and children are a vital component of forensic clinical assessment of sexual interest and arousal patterns, and the identification of treatment targets for men who have committed sexual

offenses. Penile plethysmography (PPG), sometimes referred to as penile tumescence testing (PTT) or phallogometry, is an objective measure of male sexual arousal in response to the presentation of a series of erotic and neutral stimuli. Initially developed by Kurt Freund in the former Czechoslovakia in the 1950s (Freund, 1957, 1961), PPG is now widely recognized as a reliable means of measuring male sexual arousal to specific audio-visual stimuli. PPG has been termed the “gold standard” in the objective assessment of sexual arousal patterns in men (Fedoroff, Kuban, & Bradford, 2009).

Although not a criterion in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*¹ or the *International Classification of Diseases (ICD-10)* for the diagnosis of any paraphilias or paraphilic disorders [American Psychiatric Association (APA), 2013; World Health Organization (WHO), 2015], many researchers and clinicians consider PPG to be a vital contribution to the assessment and treatment of males with paraphilic interests and males who have committed sex crimes (Fedoroff et al., 2009; Fernandez, 2009; Fernandez & Marshall, 2003; Johnson & Listiak, 1999; Marshall, 2014; Murphy, Ranger, Stewart, Dwyer, & Fedoroff, 2015). Meta-analytic research on risk factors for sexual recidivism has identified specific unconventional sexual response profiles, as measured by PPG, as the most highly correlated risk factor for recidivism among sex offenders in general, and in particular individuals diagnosed with a pedophilic disorder (Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2004, 2005, 2007, 2009).

During PPG assessment, a circumferential gauge composed of mercury or indium gallium records electronic measurements of changes in penile blood flow. Increase in circumference (as measured by change in mm) resulting from an increase in blood flow to the penis reflects the degree of sexual arousal that the stimuli elicit. Sexual response patterns can be compared to determine sexual interest in the consenting and non-consenting materials presented (Fedoroff et al., 2009; Murphy, Ranger, Stewart, et al., 2015; Murphy, Ranger, Fedoroff, et al., 2015).

Penile plethysmography contributes to the clinical assessment of paraphilic interests, appraisal of risk of recidivism, and provides an objective measurement of changes in sexual arousal in response to treatment (Barker & Howell, 1992; Fedoroff et al., 2009; Fernandez, 2009; Johnson & Listiak, 1999; Marshall, 2014; Murphy, Ranger, Stewart, et al., 2015; Murphy, Ranger, Fedoroff, et al., 2015). Prior to the development of PPG techniques, clinicians assessing individuals concerning their sexual interests and arousal patterns relied primarily on self-report for evaluations of risk, treatment needs, and assessment of outcomes. Relying solely on uncorroborated self-report can be quite problematic when the individual undergoing assessment may have motivations to not be forthcoming about their interests and behaviors (Association for the Treatment of Sexual Abusers [ATSA], 2014; Carvalho, Briken, Murphy, Bradford, & Fedoroff, 2020; Fedoroff et al., 2009; Murphy et al., 2019; Purcell, Chandler, & Fedoroff, 2015). Examples of cases in which forensic opinions may significantly affect determinations about the examinee may include child services investigations, criminal and civil cases, and assessments for Dangerous Offender (DO) or Sexually Violent Predator (SVP) designations.

Researchers and clinicians alike have consistently stressed the need to develop a standardized approach to PPG among laboratories within and between countries. This endeavor has had several hurdles. First, not all countries use PPG for clinical assessments. Even within countries, some assessment laboratories use PPG for both clinical and research purposes, while other laboratories do not (Demidova, Murphy, Dwyer, Klavilova, & Fedoroff, 2019; Murphy, Ranger, Stewart, et al., 2015; Murphy & Fedoroff, 2019). Compared with their European counterparts, PPG is used on a much wider and more frequent scale in North America (Demidova et al., 2019; Murphy, Ranger, Stewart, et al., 2015).

Of the laboratories that use PPG, there are variations in terms of modality, duration, quality, content, and theme of the stimuli presented (Demidova et al., 2019; Murphy et al., 2019). One difficulty is that different countries and jurisdictions are governed by different legal regulations concerning the types of stimuli that are permitted for forensic clinical assessments (Demidova et al., 2019; Murphy, Ranger, Stewart, et al., 2015; Murphy, Ranger, Fedoroff, et al., 2015; Murphy et al., 2019; O’Shaughnessy, 2015; Rosetti, Curry, Murphy, Bradford, & Fedoroff, 2019). For example, within Canada, the Criminal Code permits the use of nude images of children in clinical assessments where it “has a legitimate purpose related to the administration of justice or to science, medicine [...] and does not pose a risk of harm to persons under the age of eighteen years” (Criminal Code, R.S.C., 1985, c. C-46, 163. (6)). As a result,

laboratories throughout Canada typically use a combination of stimulus modalities consisting of videos, images, and/or audio sessions with a subset of age groups. Importantly, videos depicting sexual assault of children and/or images that disclose the identity of the model are never used in the laboratories referenced in this article.

In the US, on the other hand, the law prohibits use of nude images of individuals under the age of 18, providing no exceptions for forensic clinical or legal assessment purposes (18 U.S.C. § 2256(2) 2012). As a result, laboratories within the US typically rely upon a series of audio and/or images of nude or clothed adults and clothed children and teens under age 18. Historically, in the UK nude images of children were used for clinical assessment purposes. However, these materials are now prohibited due to ethical concerns about using images of children (Campbell, 2008). PPG stimuli sets in the UK are typically composed of combinations of auditory and visual material of models in bathing suits or computer-modified images.

Despite variation in international regulations and limitations, there is strong support for the utility of PPG within clinical and legal contexts within some countries (Fedoroff et al., 2009; Murphy, Ranger, Stewart, et al., 2015). PPG remains a significant contributor to clinical and forensic assessments in which each examinee who participates in PPG assessment acts as his own control subject. The individualized data output is often compared in terms of both raw scores (mm of change) and standardized scores (z-scores). The raw scores are calculated by subtracting the baseline level (circumference measurement of penis at flaccid) from the peak level (the highest level of arousal reached during the presentation of the stimulus) for each individual trial. Data are also analyzed to provide z-scores based on the standardized change in circumference. This approach provides a single scale of measurement that permits comparison of individualized responses across all stimuli presented. It also facilitates comparison between different examinees (Demidova et al., 2019; Fedoroff et al., 2009; Murphy, Ranger, Fedoroff, et al., 2015).

Erectile responses are also interpreted via indices. Indices are calculated by ratio scores or difference scores (using division or subtraction, respectively). These scores are often calculated by subtracting or dividing the highest response to the target stimulus (e.g., pedophilic scenarios) by the highest response to the comparison stimulus (i.e., adult consenting scenarios). This calculation determines the pedophile index. These indices can be calculated to reflect any targeted sexual interest reported by the examinee and they can apply to stimuli reflecting interest in any age or gender grouping (Demidova et al., 2019; Murphy, Ranger, Stewart, et al., 2015; Murphy et al., 2019).

A US law review discussing the admissibility of PPG in sentencing of criminal cases in the state of Tennessee noted that there are efforts under way to bridge the gap of standardization. Poland (2019) noted that despite the current lack of standardization in PPG assessments, there are positive trends toward increased standardized practices both within and between countries. Indeed, efforts are under way by a group of professionals, including authors of this article, working internationally to provide a unified approach to PPG assessments that is rooted within evidence-based practice (Murphy & Fedoroff, 2019; Murphy, Ranger, Stewart, et al., 2015; Murphy, Ranger, Fedoroff, et al., 2015). In 2017, an international consensus meeting was held in Prague, Czech Republic with leading experts from Canada, Czech Republic, Russia, the UK, and the US. Delegates at the meeting worked to understand international approaches to assessment and treatment of problematic sexual interests and behaviors. Time during the meeting was dedicated specifically to standardization of PPG assessments. Numerous positive outcomes and collaborative efforts emerged from this consensus meeting with new standardization initiatives emerging regularly, with future meetings planned (Murphy & Fedoroff, 2019).

Several published reports discuss the reliability and validity of PPG assessments (Fernandez, 2009; Marshall, 2014; McPhail et al., 2019; Merdian & Jones, 2011; Murphy et al., 2019). Concerning the utility of PPG, Marshall (2014), notes that, "Despite these reservations, phallometry remains the best approach to establishing a sex offender's sexual interest and, so long as the resultant data is interpreted [by experts and] with caution, they can usefully contribute to risk assessment and to defining targets for treatment" (p. 3).

This article addresses ways in which PPG has been utilized in the courts as part of expert clinical opinion. Distinctions exist in the use of PPG within the legal systems in Canada, the UK and the US. The authors all regularly conduct PPG within their respective laboratories. The three locations represented in this article were selected for inclusion as PPG is a standard part of sexual behavior assessments within each country and they produce a large

number of assessments and research on the topic. These distinctions are reviewed in terms of the history of its use and details regarding admissibility in court, and case law is explored in each country. Case law reviewed was accessed through LexisNexis, Westlaw, and the Canadian Legal Information Institute (CanLII). Support for the inclusion of PPG as expert evidence under the US Daubert criteria is provided and judicial misunderstandings on the rationale for PPG use and its clinical utility in forensic assessments are discussed.

2 | PPG USE IN LEGAL CASES

Inclusion of PPG evaluations as a part of a broader expert clinical assessment of treatability and risk of recidivism in legal cases varies by country and legal status. It should be noted that PPG results are a portion of a much broader assessment in which clinicians (often forensic psychiatrists and psychologists) consider numerous sources of information in the development of their overall clinical opinion and recommendations. PPG response profiles should only be interpreted by experts and the results should act only as a supplementary resource to guide clinical impressions. In context, PPG response profiles can be valuable to assist clinical judgements on diagnoses, risk of recidivism, and an individual's amenability to treatment.

Within criminal court cases, the admissibility of PPG as part of expert evidence has been raised for consideration within three primary realms: using results for determination of guilt or innocence during a trial; sentencing; and legal designations guided by risk to the public. Regardless of research that has found an association between deviant arousal patterns, as measured by PPG, and an individual's risk of recidivism (Hanson & Morton-Bourgon, 2004, 2005, 2007, 2009), PPG cannot act as a determination of guilt or innocence for a person accused of a sexual offense. Deviant response profiles are not an indication of guilt for the commission of a past offense (Carvalho et al., 2020; Demidova et al., 2019; Fedoroff et al., 2009; Murphy, Ranger, Stewart, et al., 2015). PPG does not act as a "lie detector" and should never be used when determining culpability for a particular offense.

Most research on individuals with pedophilic disorder has included participants who acted on their interests and were subsequently arrested (Bradford & Meston, 2011; Fedoroff, 2010). There has been some confusion regarding the important distinction between individuals with a persistent sexual interest in children and individuals who commit a sex crime against a child that is not sexually motivated. Not all individuals who sexually offend against a child would receive a clinical diagnosis of pedophilia or pedophilic disorder as determined by the DSM-5 or the ICD (American Psychiatric Association, 2013; World Health Organization, 2015). For some, the offense is committed out of convenience and is not the result of any broader offense and/or arousal patterns. Conversely, not all individuals who have a sexual interest in children act on their interest and commit child sexual abuse. People diagnosed with pedophilia who have not committed a sexual offense against a child highlight the critical difference between having a paraphilic interest and acting on that interest. Individuals cannot, and should not, be charged for problematic sexual thoughts alone (Bradford & Meston, 2011; Fedoroff, 2010; Murphy & Fedoroff, 2019; O'Shaughnessy, 2015).

Attempts to include PPG evidence in the courts as part of an accused's trial during the guilt/innocence phase have been controversial. Although accepted in some past cases, it is not currently accepted in Canadian, UK, or US courts (Glancy & Bradford, 2007; Holobinko, 2012; Purcell et al., 2015). Due to the high standard of evidence for trials and concerns about potential false negatives, expert testimony on PPG results has generally been found insufficient in meeting the expert evidence threshold in sexual offense cases during the guilt/innocence phase (Bala, Birnbaum, & Watt, 2017; Glancy & Bradford, 2007; Odeshoo, 2004; Purcell et al., 2015).

Although correctly designated as unhelpful during the trial phase of criminal cases, PPG plays a larger role, at least in some countries, in the post-conviction sentencing phase and in appraisal of risk to community safety (Glancy & Bradford, 2007; Purcell et al., 2015). Evidentiary rules at the sentencing phase are held to less scrutiny than trial standards where the court is determining potential guilt. Subsequently, PPG as part of expert evidence is used more frequently in the post-conviction phases of criminal cases (Purcell et al., 2015). Expert clinical reports may

provide the judge with insight into diagnoses, individualized risk of recidivism, and potential for rehabilitation, including treatment amiability and any specific treatment targets. This information can assist in determining appropriate sentencing options and risk-based assessments, such as DO and SVP designations.

Purcell et al. (2015) noted that in addition to the PPG results' influence on expert opinion, the examinees' willingness or refusal to consent to undergo PPG may also play a role in the court's sentencing determination. The authors suggested that an examinees' willingness to complete PPG may indicate that they have taken responsibility for the offense they were convicted of and are showing remorse. They note that this may indicate that they would be more successful in rehabilitative treatment. If this is the case, then the opposite would apply if the individual refused to consent to PPG, presumably showing a lack of remorse or willingness to successfully undergo treatment (O'Shaughnessy, 2015). However, denial has not been found to influence treatment and recidivism outcomes (Lund, 2000; Yates, 2009).

Some have suggested that being in such a position may influence the issue of informed and free consent to testing (Purcell et al., 2015). As an example, at the Sexual Behaviours Clinic in Ottawa, Canada, patients are fully informed of the consensual nature of all testing (including PPG). Despite any orders from the courts requiring the completion of a sexual behaviors evaluation, patients are told that this applies only to the act of meeting with the psychiatrist. Completion of any recommended testing is at the discretion of the patient. A final report can be completed without the PPG testing, although there may be limits to the recommendations. It is also made clear that refusal to complete PPG will not impede their access to treatment (Fedoroff, 2020; Murphy, Dwyer, Scott, & Fedoroff, 2017).

Variation exists between cases and jurisdictions regarding the admissibility and overall acceptance of PPG as a contributing factor to forensic expert opinions. In some courts, experts are required to argue for the admissibility of PPG while other courts expect inclusion of PPG as part of a complete expert evaluation. Different cases may have variations in the level of detail heard by the court about PPG explanations and outcomes. It has been noted that some courts specifically prefer the use of PPG as an objective measure of sexual interest as compared with the less reliable self-report (Carvalho et al., in press; Purcell et al., 2015).

3 | USE OF PPG IN CANADIAN LAW

Within the Canadian context, requests for forensic sexual behavior evaluations can come at various stages in the criminal justice process, including post-arrest, pre-trial, pre-sentence, and following return to the community. Before entering a plea, a defense lawyer may retain a forensic expert to conduct a sexual behaviors evaluation, including PPG assessment, in order to guide approaches for a defense or decisions regarding pleas. Post-conviction court orders can be made for assessments prior to sentencing and during application for legal designations intended to manage dangerousness. Individuals may also be referred for assessment and treatment while on probation or parole (Murphy et al., 2017; Murphy & Fedoroff, 2017; Purcell et al., 2015). Currently, PPG is only conducted on adult males, although historically some testing was completed on youths aged 16 or older who were known to have already had exposure to sexual materials. Following some controversy regarding PPG use with young offenders, the British Columbia Civil Liberties Association demanded the government intervene and the testing of youth was later prohibited (Turpel-Lafond, 2011).

The use of PPG assessment as a factor in the development of expert opinion within criminal cases in Canada began in the 1980s. The courts refer for PPG assessments for sexual offense cases as PPG is recognized as a valid and reliable objective measure of deviant sexual preferences [DPR (Re), 1996; Lykins et al., 2010; *R. v. RM*, 2005; Wilson, Abracen, Looman, Picheca, & Ferguson, 2011]. The majority of legal cases referencing PPG use are in criminal sexual offense cases.

Purcell et al. (2015) reviewed LexisNexis and Quicklaw for legal citations about PPG use between 1983 (the year of the first PPG reference) and 2012. They found a total of 349 court decisions that referenced PPG results.

There were a small number of references during the late 1980s, but increasing frequency of PPG evidence was referenced in the 1990s and into the 2000s when there were approximately 20 citations per year. It should be noted that these only include cases in which the PPG evidence was mentioned within case references. As the review solely included mention of PPG results within written decisions, this omits other cases where PPG results contributed to expert opinion but were not mentioned in the case reference. This highlights the significant importance of PPG within the Canadian legal system.

In addition, PPG has been referenced in a variety of legal matters in Canadian courts and tribunals since the 1980s. A small number of cases have been noted within family law, professional disciplinary proceedings, and civil actions. There are also frequent mentions of PPG in Canadian boards and tribunals that include: provincial Review Boards (in cases where individuals were found not criminally responsible by reason of mental disorder), the Canadian Immigration and Refugee Board, and various professional misconduct boards (Purcell et al., 2015).

Although controversial since the first introduction of PPG in Canadian courts, attempts had been made to introduce expert PPG evidence to support or refute the accused's guilt of an alleged offense (Purcell et al., 2015). In the 1994 case of *R. v. Makarenko*, the defense expert testified that it was exceedingly likely that the offense in question was committed by someone who would exhibit a sexually aggressive response profile. It was argued that since the defendant's PPG response profile did not coincide with what would have been expected, he should not therefore be held accountable for the offense. The opposing expert for the Crown (prosecution) highlighted that the information on which the defense expert based his opinion was from research involving participants who admitted a sexual interest in children and could not be generalized to individuals who denied an interest in children. The courts accepted the argument that "sexual aggressives" were an identifiable group with common characteristics and acknowledged that the accused did not have those characteristics based on his PPG response profile. However, it was noted that the lack of a deviant PPG response profile was not sufficiently reliable to rule out the accused's guilt. The accused was found guilty based on separate evidence (*R. v. Makarenko*, 1994).

The potential for inclusion of PPG evidence during trial was challenged in *R. v. J.-L.J.* (2000). The Supreme Court of Canada questioned the admissibility of PPG as part of expert evidence. The reason for concern was the potential rate of error (e.g., rate of false positives and false negatives) in establishing an individual's deviant sexual preference. The Court ruled against the inclusion of PPG results in the criminal court to help establish the finding of guilt unless a very particular profile has been identified. In the case of *J.-L.J.*, the Court did not find that there was a distinct enough response profile to meet this requirement. Subsequently, results from PPG assessments have not been deemed to meet the evidentiary standard within the trial stage of criminal offenses (*R. v. JF*, 2001; *R. v. LG*, 2001; *R. v. SD*, 2002). Despite being struck down as not meeting the standard of admissible evidence at this stage of the proceedings, PPG remains widely used for the purpose of treatment recommendations that may affect risk during sentencing and long-term designations in Canada (Bala et al., 2017).

Within Canadian courts, one of the primary uses of PPG evidence within expert opinion is during sentencing in sexual offense cases. PPG outcomes and their contribution to expert opinion aid the court in assessing the risk of recidivism and understanding of amenability to treatment (O'Shaughnessy, 2015; Purcell et al., 2015). At this stage of the proceedings, the court orders a psychiatric/sexual behaviors evaluation, which often includes PPG as part of a broader assessment process. The expert's report is presented to the court under the authority of pre-sentencing reports where the courts may require "the production of evidence that would assist in determining the appropriate sentence" (Criminal Code of Canada, 1985, s. 723[3]). The report can contribute to the judge's decision to hand down a particular sentence (e.g., a sentence that would permit access to sex offender treatment programming). Conversely, the report can assist the judge in identifying circumstances in which there is a very low likelihood of recidivism and a sentence of house arrest may be more appropriate than a custodial sentence.

Purcell et al. (2015) have questioned the potentially coercive nature of the process in which the offender is mandated for an evaluation but the offender is instructed that the PPG assessment is conducted strictly on a voluntary basis. The authors suggest that refusing to consent to the assessment may be perceived by the courts as

unwillingness to take responsibility. Although research has yet to be conducted to substantiate these concerns, the potential impact has been noted in some cases. In the case of *R. v. Palacios* (2012), it was noted that the offender's cooperation (e.g., willingness to consent) with the assessment, or lack thereof, may be perceived as an indication of whether or not the offender will benefit from treatment. Similar conclusions have been noted by the court when an offender proposes that they undergo PPG assessment as they are likely perceived as being willing to actively partake in their rehabilitation (*R. v. Mallett*, 2005). Some expert witnesses rely heavily on PPG assessments as part of their broader clinical interpretation, and, in situations where PPG data are not available, may note that the clinical report results are limited or should be interpreted with caution. Others may be confident in their broader clinical determination. Each case should be considered uniquely within the broader context of the facts of the case.

As with other countries, the lack of standardization between Canadian assessment laboratories remains an ongoing problem. From a criminal justice perspective, this may cause issues when a forensic expert for the defense uses one PPG assessment laboratory and the forensic expert for the prosecution uses a different laboratory with different stimulus and testing protocol. Things become further complicated if the PPG assessments show conflicting results (Murphy et al., 2019). PPG can provide valuable information that contributes to the formulation of the forensic expert's clinical opinion about treatability, and subsequently, risk of recidivism. Regardless of the potential complexities that arise concerning PPG evidence, Canadian courts still rely heavily on the use of post-conviction PPG as part of the clinical expert opinion, as it provides an objective measure of sexual interests as opposed to strictly relying on self-report measures when offenders may have a motivation to dissimulate (*R. v. Symes*, 2005).

Another occasion in criminal justice proceedings in which PPG results are referenced in legal decisions is in assessment for determination of DO and Long-Term Offender (LTO) designation. Somewhat similar to the SVP statutes in the US, the designation of a DO is reserved for offenders who have a persistent pattern of violent behaviors ("serious personal injury offenses") and pose a significant risk to society such that it is not believed that their risk can be reasonably managed within the community (Public Safety Canada, 2015a). DOs can be given an indeterminate sentence or a determinate sentence followed by 10 years of community supervision (Criminal Code, 1985). An LTO designation is given to people with a history of violent offenses and a high risk for recidivism, but where there is a reasonable probability of eventual control of risk within the community. When designated an LTO, the individual is subject to a long-term supervision order of up to 10 years (Public Safety Canada, 2015b). The Crown must bring forward the intention to apply for a DO or LTO designation prior to sentencing for the most recent/index offense. Should the court agree to proceed with assessment of the possibility of LTO or DO status, a psychiatric assessment is ordered (Criminal Code, 1985). When an individual is found not to meet the requirements for DO designation they are often placed on an LTO as the less restrictive designation.

During the forensic evaluation of sexual behaviors, PPG is one component that is often utilized to assist in the development of the expert's opinion on the propensity for effective risk management. For both designations, a history of sexual offense(s) is not required but is a common component of these applications. Research on DOs and LTOs has found a large number of the research participants to have a history of sexual offending, 75% and 68%, respectively (Public Safety Canada, 2012, 2017). PPG evidence is routinely mentioned in DO or LTO applications and at times plays a significant role in the court's final determination (Purcell et al., 2015). The court has maintained its view regarding PPG's reliability and credibility as evidentiary within this stage of proceedings (*R. v. RFL*, 2011). As such, while the court order may not exclusively request a PPG assessment, the results continue to be referenced in DO applications as part of the forensic expert's risk assessment. Cases have successfully utilized both current PPG assessments and historic assessments (*R. v. Clancy*, 2007; *R. v. D.M.L.*, 2010; *R. v. Fanjoy*, 2008; *R. v. Robinson*, 2009) where testing results were from the assessment laboratory of the expert witness, another assessment laboratory, or when PPG was conducted in two laboratories and the results compared in court (*R. v. Pilgrim*, 2008; *R. v. Smyth*, 2007; *R. v. Tippett*, 2011).

4 | USE OF PPG IN UK LAW

Within the UK, PPG assessments have mostly been used within the prison service and secure psychiatric hospitals, particularly the high secure hospitals, as an aid to offense formulation, risk assessment, and evaluation of treatment progress since the 1970s (Dean & Perkins, 2008). Their use ceased in the prison service in the 1980s following a ban by the then Director of Prison Medical Services, on the basis that the procedure was, in his view, excessively intrusive. However, in 1990, following the then Home Secretary's direction to introduce evidence-based sex offending treatment programs (SOTP) across the UK prison service, PPG laboratories were reintroduced within some UK prisons as part of this process. Their purpose was to assist offense formulation to help determine treatment pathways and to contribute to the pre- and post-SOTP treatment evaluations. At present, the use of PPG has once again diminished within the UK prison system. However, its use is continued among patients who have committed sexual offenses and/or who have deviant sexual interests, such as sexual sadism, pedophilia, or other paraphilic disorders. This assessment is utilized on an individualized referral basis as part of patients' multidisciplinary treatment plans (Campbell, 2008; Dean & Perkins, 2008).

Penile plethysmography in the UK is carried out, or closely supervised, by Health Care Professions Council (HCPC) registered clinical practitioners and/or forensic psychologists. HCPC registration is mandatory for qualified clinical and forensic psychologists employed within Her Majesty's Prison and Probation Service and the National Health Service forensic services. They are carried out in line with the British Psychological Society's (BPS) professional guidelines for their use (BPS, 2008; Campbell, 2008).

These 2008 guidelines were drafted for BPS approval by a team including one of the current authors (DP) and replaced the previous BPS guidelines, also drafted by a team including this author. The guidelines are intended "to inform good practice in PPG assessment, whilst also allowing for the exercise of professional judgement in individual cases and situations" and "to support professional practice that is responsive to the diversity of participants at every stage of the assessment." The guidelines specify that:

- PPG assessments for clinical purposes should only be carried out in the context of an appropriate range of other assessment and/or treatment procedures.
- PPG assessments for research purposes should only be completed if these have been professionally and ethically approved by the relevant regulatory bodies.

The guidelines go on to define "appropriate clinical purposes for the PPG use" as (BPS, 2008):

- a. To provide physiological evidence of patterns in sexual arousal;
- b. To facilitate participant acknowledgement of their sexual arousal/interests and their engagement in treatment;
- c. To develop formulation of problematic or offense related sexual behavior (e.g. to test a credible hypothesis that offense-related sexual arousal contributed to an offense/s);
- d. To assist treatment planning and risk management decisions; and
- e. To assist measurement of changes in sexual arousal/interest.

Under the guidelines, as also seen in Canada and US, it is prohibited to use PPG to establish a participant's guilt or innocence concerning a particular offense(s). It is noted that PPG assessment data are not to be used to "draw conclusions, or make inferences" about the potential guilt of a specific offense. Furthermore, PPG outcomes are not able to provide conclusive evidence of the "existence or lack of propensity" to commit offenses in the future (BPS, 2008). Subsequently, PPG evidence is rarely entered at the time of a criminal trial where issues of guilt, culpability, motivation, and diminished responsibility are being addressed.

Despite their limited use before conviction, PPG assessments have routinely been included in the clinical team/multidisciplinary treatment planning and submitted as evidence to the quasi-judicial Parole Board and

Mental Health Review Tribunal (MHRT) hearings for the purpose of decision-making. These two bodies, within the prison and mental health settings, respectively, make independent decisions about risks of future offending and whether the offender or patient is still being appropriately detained. They can also make non-binding recommendations for further assessment and treatment interventions (BPS, 2008). PPG findings in these settings will be used, for example, as part of a comprehensive assessment of the individual's past offending behavior.

As it pertains to the use of PPG for Parole Board hearings and reviews, PPG is utilized to assess the risk posed to the public prior to recommending the offender's release [*R (on the application of M) v. Secretary of State for the Ministry of Justice*, 2009]. In this case, PPG testing was utilized by the Parole Board in 2007. The claimant's results did not indicate any change in sexual arousal "and in those circumstances, no recommendation was made" (p. 3). As part of the claimant's next Parole Board review, PPG testing was proposed as a means to assess whether he could be "transferred to open conditions establishment in order [for him] to develop and test a robust release plan incorporating a contingency release plan" (p. 3).

The guidelines note that PPG assessments are only to be completed for clinical purposes and as part of a range of other standard assessment and/or treatment procedures. Stimuli use in PPG assessment is also noted as being intended to target the examinees' specific needs within treatment and risk management and should be proportionate to the purposes of the assessment. That is, the PPG cannot be more extreme or extensive than is strictly required to complete the assessment. It falls under the directive of the supervising psychologist to ensure that other collateral information can support the purpose of the PPG (such as sexual history, criminal history, physical and mental health history) (BPS, 2008).

In order for PPG to be utilized within the catchment area, its use must comply with the BPS guidelines. As such, the use of PPG must intend to identify sexual response patterns, aid the examinee in acknowledging their deviant sexual preferences, determine what sexual response patterns would be reflective of specific sexual offenses, or aid in the creation of a treatment plan with the intent to mitigate risks. PPG findings may also be used as part of evidence submitted to clinical teams, case conferences, MHRTs, and the Parole Board regarding their changes in sexual arousal patterns as a way of measuring treatment progress (BPS, 2008).

One issue in the use of PPG assessments as part of pre- and post-treatment assessment was illustrated in the HM Inspectorate of Probation Report (2006) following a homicide committed by ex-prisoner, Anthony Rice. Rice was released from prison in November 2004 after serving 15 years of a life sentence for attempted rape. He was subject to lifetime supervision and was being jointly managed by the Hampshire UK Police and Hampshire Probation Area under the Multi Agency Public Protection Arrangements (MAPPA). He was living at a residential training and rehabilitation center run by a registered charity when he was released.

Nine months after his release, a 40-year-old woman, Ms. Naomi Bryant, was sadistically murdered at her home in Winchester, Hampshire. Rice was arrested and later convicted of Ms Bryant's murder and the wounding of another woman. He was sentenced on both counts to life imprisonment with a 25-year tariff. An inquiry into the circumstances around the murder found that there was a sequence of mistakes, misjudgements, and miscommunications at all the stages leading to Rice's release. During his prison term, Rice completed the core sex offender treatment program and was then to undertake further psychological treatment, which the inquiry report described in these terms:

Specifically, there was a plan to address his offense-related fantasy, and to measure his progress objectively using a PPG assessment [...] however, by the time of the Parole Board hearing [...] some eight months after the psychologist's report, Anthony Rice had undertaken some additional sessions. This had focused on developing his cognitive and behavioral strategies to control deviant fantasies. The panel received a report stating that this work had addressed Rice's outstanding treatment needs, and that a *PPG was no longer necessary* [emphasis added]. (HM Inspectorate of Probation Report, 2006)

One view was that the therapy completed that targeted his sadistic sexual interests should have included PPG as an objective measure of his sexual interests and arousal. Opponents suggested that, as he appeared to be open about his deviant sexual fantasies and urges, PPG assessment was unnecessary. It was assumed that, as he had been apparently open at the beginning of treatment, his post-treatment account of reduced fantasies and urges was also reliable. After the murder of Ms Bryant, it became evident that his sexual interests and urges remained and he simply told the staff that he had recovered, so no PPG assessment had been completed to objectively confirm his report.

Unusual for this kind of inquiry report, the authors made specific comment on PPG assessment in these terms:

We strongly recommend that, if the PPG can be made available and has proved to be a reliable indicator of deviant sexual preferences, no sex offender on an indeterminate sentence should be moved to open prison conditions without undergoing this testing. (HM Inspectorate of Probation Report, 2006)

The submission and consideration of PPG findings should, as indicated earlier, be carried out in the light of all available relevant evidence on the case (e.g., file information, other professional reports, institutional behavior) and the current knowledge regarding sexual offenses and its assessment, including PPG. The guidelines also make clear that participants are required to give informed consent and be appropriately debriefed following the assessment. The examinee is to be informed of the purpose of the assessment, what it entails, how the results will be interpreted, the limitations of PPG results, the limits of confidentiality, and their right to withdraw consent at any time throughout or after the assessment (BPS, 2008). Following the PPG assessment, the examinee must be debriefed in order to assess the possible impact of PPG. The debrief assists in determining whether the examinee requires support or advice, and whether the information gathered is to be reported to other professionals.

Dean and Perkins (2008) noted some practical challenges regarding the use of PPG in the UK. Obtaining engagement on behalf of the examinee can be perceived as intrusive, embarrassing, and anxiety-provoking. Logistically, there are also a few challenges associated with PPG. It is time-consuming to implement, taking approximately 2 hours to complete. This includes preparation, assessment, and the debrief. PPG is also costly to administer as a result of the complex and demanding requirements associated with the laboratory procedure. Potential legal issues for practitioners in the use of PPG assessments are identified in the BPS guidelines (BPS, 2008):

- PPG assessment equipment should be fit for purpose and be subject to appropriate levels of maintenance and replacement as necessary;
- Selection of stimuli to be used in PPG assessment should take into account current legal and ethical issues, e.g., defensibility in law of the possession and use of the stimuli in question, and knowledge of how the stimuli were produced, e.g., ensuring that this was not under abusive circumstances;
- The use of or production of stimuli for the purposes of assessment must be done with due consideration for the current legal position. If there is any doubt about the legality of stimuli being used or produced, appropriate legal consultation and advice should be sought and recorded for reference;
- Stimuli for PPG assessment should be kept secure and access should be limited to those using them for professional assessment purpose.

To comply with these professional and legal requirements, stimuli used in PPG assessment in the UK comprise only non-photographic images depicting men, women, boys and girls. As a result, the "not real people" (NRP) stimuli set are used. The NRP stimuli set was created, utilizing several images spliced onto each other to look like an image of a real person in a specific Tanner stage, without being an image of one actual person.

There are also depictions of adult sexual violence ethically produced by regulated filmmakers and actors, as in the CRV ("consent, rape violence") moving images set developed by one of the current authors (Hogue, Wesson, & Perkins, 2017), or auditory stimuli, describing different types of sex offense scenarios ("Marshall" stimuli set). The guidelines also address the issue of minimizing harm in the use of PPG assessment (BPS, 2008):

- Selection of PPG stimuli – both content and modality – should take into account the need to strike an appropriate balance between seeking to obtain the best possible assessment of risk and/or treatment need and minimising the danger of exposing the participant to material that may be therapeutically counter-productive; and
- For clinical assessments PPG stimuli should be targeted to the participant's specific needs – regarding risk management and/or treatment need – and should be proportionate to the purposes of the assessment, e.g. not more extreme or extensive than needed for the assessment.

In cases where one may suggest that exposure to PPG stimuli had generated or stimulated harmful behavior by the examinee, counterarguments rooted within the guidelines, could be that the types of stimuli used are no more extreme than the participant has already been exposed to in their life and are of a type that can be seen or heard on late-night television.

Penile plethysmography assessment in UK law is regarded as a clinical procedure, the use of which should not breach any law (e.g., the Obscene Publications Act) and should be in line with what a body of the practitioner's professional peers would consider appropriate. The second criterion could be established by reference to compliance with the BPS guidelines, evidence of the practitioner being up-to-date with the literature, their continuing professional development, and receiving appropriate clinical and professional supervision (BPS, 2008).

5 | USE OF PPG IN US LAW

In the US, sexual behavior evaluations may be requested for various legal issues. Specifically, they may be requested on a pretrial basis for defendants who have been charged with sexual offenses (e.g., evaluation requested by a defense attorney to be introduced if they opine it will be helpful for their client); at the sentencing phase for defendants who have been convicted (e.g., treatment recommendations, conditional release, dangerousness); non-criminal matters such as family custody disputes (e.g., diagnostic assessment during custody dispute after allegations raised of sexual misconduct); and for post-sentencing civil commitment proceedings. Twenty US states, the District of Columbia, and the US federal government have enacted some version of a Sexually Violent Predator/Sexually Dangerous Person (SVP/SDP) Act. Typically, these Acts call for the civil commitment of individuals who were convicted of a sexually violent offense, are reaching the end of their criminal sentence, and are determined to be at risk for committing a new sexually violent offense due to a mental or personality disorder or anomaly which affects their volitional capacity (Janus, 1997; Prentky, Janus, Barbaree, Schwartz, & Kafka, 2006).

The Association for the Treatment of Sexual Abusers (ATSA) published their latest practice guidelines for the ethical assessment and treatment of male sexual abusers in 2014 in which the importance of using empirically supported methods in conducting evaluations with individuals convicted or charged with sex offenses was stressed. Despite the presence of this guide, there are no universally accepted standards of practice that exist specifically for the evaluation of individuals undergoing evaluations pursuant to an SVP/SDP statute for the prediction of sexual offender recidivism. Assessment techniques used in evaluations of sexual behavior differ between sites. Some states (e.g., California) have standardized procedures for conducting evaluations used in particular contexts (e.g., SVP proceedings), whereas other states (e.g., South Carolina) have no guidelines or procedures for conducting these evaluations.

Unlike some of the US's international neighbors, the US courts have not reached a legal consensus regarding the admissibility of certain assessment techniques, such as PPG tests, and the legal opinions vary widely regarding the admissibility of these techniques. The US Supreme Court, to date, has not granted certiorari on a case of admissibility of assessment techniques in a case regarding sexual behavior, although US District Courts and Courts of Appeals have issued opinions on the matter. To follow is a summary of recent judicial holdings relevant to PPG testing. Legal holdings regarding the use of PPG tests fall into one (or more) of several categories: admissibility based on evidentiary standards, a condition of supervised release, invasion of privacy/liberty issues, and improper exclusion.

5.1 | PPG admissibility based on evidentiary standards

The US federal government and many states use the conditions set forth in *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (1993) or some variation of this in determining admissibility of expert testimony and scientific tests. Some courts have noted that the PPG fails to meet *Daubert* standards as it has no accepted standards in the scientific community; it is susceptible to errors and manipulation and lacks standardization; and it subjects a defendant to be engaged in the “possession, use and distribution of child pornography” (*US v. Cheever*, 2016, p. 13). In that case, the condition of supervised release which required Cheever to submit to PPG testing was rejected by the court. However, as previously noted, due to US law, no child pornography is used as PPG stimuli.

In *US v. Powers* (1995), the Fourth Circuit Court of Appeals held that a district court did not abuse its discretion in ruling that the PPG failed to meet scientific validity requirements for admissibility. Specifically, the Court noted that the Government provided “evidence that the scientific literature addressing penile plethysmography does not regard the test as a valid diagnostic tool because, although useful for treatment of sex offenders, it has no accepted standards in the scientific community” and that “such false negatives render the test unreliable” (*US v. Powers*, 1995, p. 1471).

Conversely, in 2013, a Florida district court of appeals held that the PPG test had been admissible under the *Frye* evidence standard used at the time of the case² and that “the trial court erred in excluding evidence of a penile plethysmograph (PPG) test” (*Conley v. State*, 2013, p. 1120). They cited the holding in *State v. Fullwood* (2009) which “affirmed the admission of PPG evidence in a Jimmy Ryce Act [e.g., Florida's SVP Act] proceeding after the trial court found PPG evidence was not new or novel evidence subject to analysis under *Frye v. United States*” (*Conley v. State*, 2013, p. 1121). Another Florida court opined that the PPG met the standards put forth in *Daubert* as it noted, “[T]his Court finds that the underlying principals [*sic*] and methods are scientifically reliable and Dr. [evaluator's name] conducted the test in a scientifically reliable manner as applied to the facts of this case. As such, the expert opinion on PPG testing is admissible under *Daubert*” (*In re Rivers-Finney*, 2015, p. 5).

Other courts have not explicitly decided on the issue. For example, an Appeals Court of Massachusetts ruled that PPG tests “are not expressly made admissible by statute” and the court had “no basis from the record or case law to determine whether PPG tests constitute a permissible basis for an expert to consider in formulating an opinion” (*In re Gammell*, 2014, p. 415). In *People v. Maynez* (2019), a California court of appeal noted that “No published decision in California has found PPG testing to be reliable and admissible under the *Kelly/Frye* [evidence] test” (p. 7). They noted that the experts in Maynez's case “acknowledged the PPG test is subject to manipulation by the subject and is of limited use for that reason” (*People v. Maynez*, 2019, p. 7). A legal scholar noted, “The extensive scientific research on the physiological response [e.g., PPG] to stimuli and connection to recidivism suggests some general acceptance of such evidence in the scientific community [...] However, major concerns arise when considering the methodological testing, rate of error, and existence of an analytical gap between the data and the opinion provided” (Poland, 2019, p. 377).

5.2 | PPG and supervised release

This category of cases is regarding whether a defendant can be mandated to undergo PPG testing as a condition of supervised release after a conviction for a sexual offense. For example, the Ninth Circuit Court heard a case in which it was argued that having to submit to PPG testing as a requirement for conditional release should be vacated because “such testing (1) is not reasonably related to the purposes of deterrence, rehabilitation, or protection of the public, and (2) even if it does satisfy one of the above purposes, the testing requirement results in a greater deprivation of liberty than is reasonably necessary” (*US v. Weber*, 2006, p. 561). The Court noted “the accuracy and reliability of penile plethysmograph testing have been severely questioned” and represented a “significant liberty interest” (p. 564). In light of this, the Court held, “The requirement that [Mr.] Weber submit to plethysmograph testing as part

of his sex offender treatment program was imposed without the necessary evidentiary record, justification, and findings we now hold are required” (p. 570). This holding has been cited in numerous similar cases in other jurisdictions.

In the US Court of Appeals, Second Circuit, it was held that mandating PPG testing as a condition of supervised release was an “extraordinary invasive condition [that is] unjustified, is not reasonable related to the statutory goals of sentencing and violated [Mr.] McLaurin’s right to substantive due process” (*US v. McLaurin*, 2013, p. 260). The US Court of Appeals in the First Circuit held that the supervised release condition of requiring PPG testing was a “miscarriage of justice” and that the district court committed “plain error” in imposing supervised release condition that required defendant to undergo PPG testing (*US v. Velez-Luciano*, 2016, p. 27). Another US Court of Appeals held that requiring a defendant to undergo PPG testing as a term of his sentence that was “imposed without any explanation by the district court, should be vacated” (*US v. Berrios-Cruz*, 2016, p. 731). In 2015, the First Circuit US Court of Appeals held that “any decision to reimpose the PPG testing condition [of supervised release] would require further factual development to show its reasonableness” (*US v. Medina*, 2015, p. 73).

Other courts have issued opinions favoring the other position. For example, a Washington Court of Appeals held that the statute which granted the trial court discretion to compel the PPG testing “applies only in the context of determining whether the person named in the SVP petition is an SVP” (p. 445), is not “unconstitutional on its face” (p. 445) and the appellant’s “challenge to the reliability of PPG testing fails” (*In re Detention of Herrick*, 2017, p. 450). Herrick’s case was then heard by the Supreme Court of Washington in 2018 and the Court held that the Code of Washington statute that authorized PPG testing was not unconstitutional and that the trial court did not “abuse its discretion in finding Herrick in contempt” for not completing PPG testing (*In re Detention of Herrick*, 2018, p. 248). The Sixth Circuit Court of Appeals heard a case in which the defendant-appellant had appealed the conditions of his supervised release to undergo PPG and polygraph to a district court. It was noted that “none of the cases or studies cited by defendant suggests that polygraphs and plethysmographs fail the probable accuracy test” and that the district court did not abuse its discretion to order these as part of sentencing (*US v. Wilson*, 1998, p. 2). The court also noted, “It is conceivable that results of the tests may be deemed sufficiently reliable to serve as evidence that defendant has violated the conditions of his supervised release” (*US v. Wilson*, 1998, p. 3). A defendant filed a Petition for Writ of Habeas Corpus in a US District Court and cited that his attorney failed to argue “that the requirement that he submit to penile plethysmograph testing violated the Eighth Amendment’s prohibition on cruel and unusual punishment” (*Olmos v. Ryan*, 2013, p. 17). The court noted that “The Ninth Circuit has upheld the use of penile plethysmograph in certain instances as a condition of supervised release” and that “Plethysmograph testing has been recognized by some psychologists and researchers as a useful technique in the treatment of sexual offenders” (*Olmos v. Ryan*, 2013, p. 17). As noted in Blumberg (2018), a Fourth Circuit court held in *US v. Music* (2002) that “Although there is no blanket rule that plethysmograph evidence is inadmissible, the test ‘lacks accepted standards in the scientific community’ and that the test is prone to producing false negatives,” the PPG was a valid treatment condition for supervised release (p. 608).

5.3 | PPG and privacy/liberty issues

Other cases have noted concerns about the PPG being an invasion of privacy. In South Carolina, a petitioner, Mr LaSure, appealed his case to a district court and cited “PPG has been shown to be an unreasonable invasion of his privacy and thus violates his Fifth Amendment rights as to self incrimination, and that the PPG testing and evaluation are not a clear legal basis to detain him [in the SVP treatment program]” (*LaSure v. State of South Carolina and Zmroczek*, 2019, p. 1). However, the district court did not opine on that particular issue and dismissed the case. Although a US district court did not opine on the reliability of the PPG, it held that in that particular case, “the PPG special condition [of supervised release] involves a greater deprivation of liberty than is reasonably necessary for the purposes set forth in the [US Code of Laws]” (*US v. Gutierrez*, 2010, p. 3). In a US district court in Colorado, it was held that a requirement that a defendant undergo PPG testing must be

imposed by a district court and be “supported by particularized findings that it does not constitute a greater deprivation of liberty than reasonably necessary to accomplish the goals of sentencing” (*US v. Behren*, 2014, p. 1156).

Other courts have held that requiring a defendant to undergo PPG testing was not an invasion of their privacy. For example, an appeals court in Washington held that holding the appellant in contempt of court for refusing to undergo PPG testing was not a violation of his constitutional right to privacy as he had “limited privacy rights as a sexual offender” (*In re Detention of Brennan*, 2015, p. 1). It was noted that the Code of Washington “authorizes the court to order a sex offender to submit to PPG testing after probable cause has been determined” (p. 2), that other courts “have held that PPG testing is useful as part of a diagnostic process” (p. 3), and “that PPG testing is a valid sentencing condition and is regarded as a treatment device for diagnosing and treating sex offenders” (*In re Detention of Brennan*, 2015, p. 3).

5.4 | Improper exclusion of PPG

Other defendants or appellants have raised the issue that the PPG results were improperly excluded. For example, in *Commonwealth v. Ortiz* (2018), a Massachusetts appeals court held that a trial judge “did not abuse his discretion in excluding the PPG examination results; it has not been established that use of the PPG exam to show the likelihood of sexual reoffense is generally accepted in the clinical community or that a review of the *Daubert-Lanigan* [evidence standards] factors favors admission of evidence based on such as exam” (p. 389). The court additionally noted that there was no error in “the judge’s finding that, although the PPG appears to be commonly used as a tool in the *treatment* [sic] of sex offenders, it is not generally accepted in the clinical community for use in *diagnosis* [sic]” (*Commonwealth v. Ortiz*, 2018, p. 386).

5.5 | Judges/legal scholars’ recommendations for PPG in the US

A few cases/legal texts have offered recommendations for judges in determining if the PPG results should be introduced. For example, *In re Detention of Herrick* (2018), the Court noted that PPG testing is intrusive and that it was up to trial courts to evaluate the request for testing. The Court provided the following examples for this:

“... judges should ask why a PPG test is the preferred testing tool; what the specific purpose of the test, is relative to the individual; whether there is any evidence of dishonesty or manipulation by the individual regarding the stimuli for sexual arousal that the PPG will rebut; and whether there is any other test that is less intrusive that will render the same information or be equally effective in evaluating the individual” (*In re Detention of Herrick*, 2018, p. 246).

Poland (2019) also offered recommendations for using PPG results in sentencing. Based on the New Mexico Rule of Evidence for admitting polygraph data in court, Poland (2019) recommended that “The rule would require the party admitting the PPG results to lay the proper foundation;” at least “two relevant stimuli be presented to the subject, with relevance determined by the offense for which the subject was convicted;” “extensive written records must be kept regarding the procedure, self-reporting, and interviews;” and “procedural protections regarding notice, challenge, and a second evaluation” (p. 386).

6 | DISCUSSION

As described in this article, the use and admissibility of PPG evidence vary between countries and jurisdictions. In the US, the courts’ stance on PPG evidence has varied widely. Although individual US states use divergent criteria

for assessing the admissibility of scientific data and expert testimony, many states use versions of the criteria laid out in *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (1993). These criteria include:

1. Whether the theory or technique in question can be and has been tested;
2. Whether it has been subjected to peer review and publication;
3. Its known or potential error rate;
4. The existence and maintenance of standards controlling its operation; and
5. Whether it has attracted widespread acceptance within a relevant scientific community.

To follow are examples of data that could be used to satisfy the *Daubert* criteria and which strengthen the argument for the clinical utility of PPG as part of expert opinion in forensic cases, regardless of the country in which it is being used. For the first and second criteria, the PPG has been the subject of numerous studies that have been published in peer-reviewed journals. Although there is a long history of research on the PPG, within the last 5 years specifically, it has been studied using samples of men with pedophilic interests (Müller et al., 2014), examining attempts to dissimulate (Babchishin, Curry, Fedoroff, Bradford, & Seto, 2017; Trottier, Rouleau, Renaud, & Goyette, 2014), comparisons of PPG laboratories, techniques, and standardization (Demidova et al., 2019; Murphy & Fedoroff, 2019; Murphy, Ranger, Stewart, et al., 2015; Murphy, Ranger, Fedoroff, et al., 2015), PPG stimuli (Dennis, Rouleau, Renaud, Nolet, & Saumur, 2014; Murphy et al., 2019; Murphy, Ranger, Fedoroff, Burke, & Dwyer, 2016; Rosetti et al., 2019), and meta-analytic techniques (McPhail et al., 2019).

Regarding the error rate of the PPG, previous research has demonstrated that the PPG can accurately discriminate between men convicted of sex offenses against children from those who have not (e.g., Barbaree & Marshall, 1989; Freund & Blanchard, 1989; Lalumiere & Quinsey, 1994; McPhail et al., 2019). No test is without its limitations; however, widely accepted medical tests (e.g., hematologic blood values, endocrinologic hormone levels, blood pressure measurements, HIV screening tests) develop cut scores that balance specificity and sensitivity (e.g., Tan et al., 2016; Waaler, 1980). Given the potentially significant legal ramifications of showing a deviant PPG response profile, along with maintaining the delicate legal balance between public safety and protecting the individual rights of the examinee, it is better to have more false negatives than false positives.

A number of studies have examined specificity (true negatives) and sensitivity (true positives) in PPG (e.g., Barsetti, Earls, Lalumiere, & Belanger, 1998; Freund & Watson, 1991; Blanchard, Klassen, Dickey, Kuban, & Black, 2001; Seto, Lalumiere, & Blanchard, 2000; Wilson, 2016; Wilson & Miner, 2016). Winsmann (2017) reported that most studies report rates of specificity to be around 95% whereas sensitivity has been reported to range from 40% to 95% across studies, with the highest specificity to be in studies assessing men who offended against children. It is notable that a recent study by Babchishin et al. (2017) reported that four out of five men who had committed sexual offenses against children were not able to suppress their sexual arousal in relation to children during PPG testing.

Regarding the existence and maintenance of standards controlling its operation, a trained PPG technician should follow multiple standards, including proper calibration of the gauge, the use of countermeasures to detect dissimulation, and the use of certified technicians and interpreters (Murphy, Ranger, Fedoroff, et al., 2015). The PPG has widespread acceptance in clinical, scientific, and legal communities throughout North America and parts of continental Europe as the best measure of deviant sexual arousal as evidenced by its presence in authoritative texts (e.g., in the DSM-5 APA's, 2013; ATSA guidelines, 2014; Plaud, 2019).

Additionally, as previously highlighted, wording in certain legal cases illustrates certain courts' misunderstanding of the procedure. First, current PPG administration does not require the examinee to masturbate; in fact, it is prohibited to manually manipulate the penis or the device during testing. The sensitive nature of the gauge would immediately signify to the technician if the device is being touched or manipulated. An example of this misunderstanding is illustrated in the following quote. "[...] a prisoner should not be compelled to stimulate himself sexually in order for the government to get a sense of his current proclivities. There is a line at which the government must stop. Penile

plethysmograph testing crosses it" (*US v. Weber*, 2006, p. 571). Additionally, the belief that examinees must masturbate for the examination has been repeated in other cases (e.g., *US v. McLaurin*, 2013).

Another clarification to address frequent misunderstandings of the protocol is that the PPG gauge is placed on the penis by the examinee, not the technician. The examinee places the gauge on themselves in a private room. After being placed on the penis, the sensitive nature of the gauge would immediately signal to the technician if the device was not on properly and needed to be adjusted; thus there is no need for the technician to place the gauge. The examinee sits alone in a private room during the assessment and his groin area is covered by a sheet and his upper body is monitored on camera to ensure there are no attempts at dissimulation or avoiding gaze towards the presentation of visual stimuli (Murphy, Ranger, Stewart, et al., 2015, Murphy, Ranger, Fedoroff, et al., 2015).

The case of *Waters v. Blaine* (2017) demonstrates the Courts' disdain for the test based on colorful language, "His immediate willingness to undergo a test which might be likened to a 'colonoscopy of the soul' while subject to civil and criminal prosecution speaks volumes to his actual innocence of the charges levied against him" (p. 12). Still other cases liken the PPG to "such pseudoscientific practices as phrenology and physiogamy" (*US v. Cheever*, 2016, p. 13). The numerous peer-reviewed studies on the validity and reliability of the PPG support its use as the "gold standard" in measurement of deviant sexual arousal profiles, thus refuting any concerns that PPG is a "pseudoscience."

US v. Cheever (2016) was mentioned previously as it incorrectly referenced subjecting the examinee to child pornography. Specifically, it was noted, "It is paradoxical that the government would mandate individuals subject to supervised release to join an administrator of the test in conduct so vile that it landed him in prison in the first place. The statute criminalizing the possession, use and distribution of child pornography has no exceptions. Both the administrator and the subject are violating the statute [...] it makes not one shred of difference to the victims that the viewer is a pervert or a therapist" (*US v. Cheever*, 2016, p. 15). In a recent trial during which one of the current authors offered expert testimony, an attorney incorrectly noted that because Czechoslovakia was part of the "Soviet Union," the PPG test was a "communist" test and should not be used. These examples clearly demonstrate that, at least in the US, it is going to take significant work in educating the courts on the scientific utility of PPG that would ensure they look past their misperceptions and biases about the test. Lessons can be learned from legal determinations on the use of PPG within Canadian courts.

Finally, *US v. Cheever* (2016) also points out that "PPG evaluators recognize 1) the power of refrain; and 2) the difference between thought and action" (p. 16). We would note that in legal cases, individuals being tested with the PPG have been convicted or pled guilty to sexual offenses. While showing arousal to abusive stimuli in the laboratory does not mean that the examinee will go on to commit new offenses, it has been found to provide a link between risk of recidivism and the pattern of sexual arousal (Hanson & Morton-Bourgon, 2004, 2005, 2007, 2009). These findings highlight the value of PPG in clinical determinations of dangerousness. Deviant response profiles can also provide areas to target in treatment that would help reduce risk for recidivism.

7 | CONCLUSION

This article provided a comprehensive overview of the admissibility of PPG assessments within the courts in Canada, the UK and the US. PPG is widely recognized as the most reliable and valid objective measure of sexual interest and arousal. Although variation exists in the point within the criminal justice process that PPG may be admitted and the exact reasons for the admissibility, within all three countries PPG has been excluded as a means to determine guilt or innocence. Clinicians and researchers alike note the strong support for the utility of PPG as part of sexual behavior assessments and forensic evaluations. PPG results play a strong role in determinations of risk, identification of treatment targets, and measurement of treatment outcomes. Although frequently used within the US for clinical assessment and in forensic cases, US courts have been less accepting of PPG than their counterparts. This is largely due to

TABLE 1 Admissibility of penile plethysmography as evidence during criminal or civil proceedings by country

	Canada	United Kingdom	United States
Trial	No	No	No
Sentencing	Yes	Rarely	Sometimes
Risk-based designations	Yes DO/LTO	Yes – Parole Board and Mental Health Review Tribunal	Sometimes – SVP/SDP

misunderstandings of the PPG process and its strong scientific foundation. US courts can benefit from education on PPG practices and support for its significant contributions to forensic expert opinion.

Furthermore, drawing on the legal precedents set in Canadian courts and the successful implementation of guidelines regulating PPG assessment within the UK, there is an existing framework from which to draw. Having regulations and guidelines in place helps to ensure uniform application of PPG procedures across laboratories. Ongoing international work towards standardization is of significant value; however, support for PPG meeting the Daubert criteria for admissibility is already in place. Given the success that PPG has had within forensic cases in Canada and the UK, along with evidence that PPG does indeed meet the *Daubert* criteria, it is hoped that the US courts begin to recognize its value as a contributor to forensic clinical expert opinion. The three countries reviewed in this article were chosen, because they represent the bulk of PPG assessments and research. However, this review is limited as it does not discuss all countries that use PPG. An exhaustive list of countries that use PPG and research comparing the use of PPG in legal cases in other countries would be an important next step for future research (Table 1).

ENDNOTES

¹ Although new to the DSM-5 (American Psychiatric Association, 2013) is the mention of PPG in the text for paraphilic disorders and pedophilic disorder (e.g., “The most thoroughly researched and longest used of such measures is *penile plethysmography*, although the sensitivity and specificity of diagnosis may vary from one site to another”; p. 699).

² Florida began using the *Daubert* standard in 2013.

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- Note: DO = Dangerous Offender; LTO = Long-Term Offender; SVP = Sexually Violent Predator; SDP = Sexually Dangerous Person.

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