

**RECOMMENDATIONS FOR IMPROVING THE QUALITY OF ADULT DRUG
COURT OUTCOME EVALUATIONS MEASURING RECIDIVISM**

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March 1, 2018 marked my eighth anniversary working in the courts. When I accepted my position as Recovery Court Coordinator, I never imagined the courts would be where I decided to make my career, that in a few short years my recovery court would be nationally recognized, and that I would be a participant in a professional development program of such prestige. With the utmost gratitude, I thank the following people:

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RECOMMENDATIONS FOR IMPROVING THE QUALITY OF ADULT DRUG COURT OUTCOME EVALUATIONS MEASURING RECIDIVISM

Andrew P. Brown

Abstract

The first adult drug treatment court (drug court) was organized and implemented in Miami, Florida in 1989 in response to the crack-cocaine epidemic impacting their local criminal justice system (Goldkamp, 1993). Since that time, nearly 2,000 adult drug courts and over 1,000 other specialty court programs, based on the drug court model, have been implemented across the United States (Marlowe, Hardin, & Fox, 2016; National Institute for Justice, 2017).

Numerous evaluations of drug courts, and meta-analyses of drug court evaluations, have been completed over the past 25 years. The results of these evaluations have demonstrated that drug courts are more effective at reducing recidivism than traditional probation (Marlowe, Hardin, & Fox, 2016). However, this conclusion has been consistently clouded by concern and criticism about the methodological quality of drug court evaluations measuring recidivism. (Gutierrez & Bourgon, 2009; Mitchell, 2012; Wilson, 2006).

This paper explores causes for the continued criticism of drug court outcome evaluations measuring recidivism and proposes recommendations to address these concerns. This is accomplished by performing a review of academic and professional literature about drug court evaluation and through a structured review of nineteen different published drug court evaluations measuring recidivism. Findings from the review revealed limited published guidance for performing drug court outcome evaluations measuring recidivism and considerable differences amongst evaluations regarding variables used for matching, definitions of recidivism, and presentation of recidivism findings.

It is concluded that: (a) there is a lack of uniform standards and processes for creating matched-comparison groups, data collection, and for the measurement and presentation of recidivism findings; and (b) the lack of any formal technical advisory in academic and professional literature that creates more uniform standards and guides the design, data collection, and presentation of recidivism findings for drug court does not exist and has not allowed our profession to advance the quality of drug court evaluations measuring recidivism.

It is recommended that: (a) baseline standards for constructing match-comparison groups, and data collection be created, and that uniform guidelines for defining and presenting recidivism findings be established (as incorporated into this paper); and (b) that these standards be used to create a technical advisory for drug court professionals and evaluators, unique to the conduct of drug court evaluations measuring recidivism.

Introduction

Numerous evaluations of adult drug treatment courts (drug courts), and meta-analyses of drug court evaluations, have been completed over the past 25 years. The results of these evaluations have demonstrated that drug courts are more effective at reducing recidivism than traditional probation (Marlowe, Hardin, & Fox, 2016). However, this conclusion has been consistently clouded by concern and criticism about the methodological quality of drug court evaluations measuring recidivism. (Gutierrez & Bourgon, 2009; Mitchell, 2012; Wilson, 2006).

This paper explores causes for the continued criticism of drug court outcome evaluations measuring recidivism and proposes recommendations to address these concerns. This is accomplished through multiple steps beginning with a review of academic and professional literature exploring the evolution of drug courts, the methods of evaluating drug courts, and the drug court research performed to date. Next, drug court practitioner focused materials are reviewed to determine the extent and quality of guidance available for designing and executing drug court outcome evaluations measuring recidivism. Finally, drug court outcome evaluations measuring recidivism that were published in academic literature are closely examined to understand the methods used for the construction of matched-comparison groups, data used in the evaluations, and how recidivism is defined, measured, and presented. Based on these steps, recommendations are made to guide drug court professionals and evaluators in constructing matched-comparison groups, identifying key data to collect, and more uniformly defining and presenting recidivism findings in outcome evaluations.

Literature Review

The first adult drug treatment court (drug court) was organized and implemented in Miami, Florida in 1989 in response to the crack-cocaine epidemic impacting their local criminal justice system (Goldkamp, 1993). Since that time, nearly 2,000 adult drug courts and over 1,000 other specialty court programs, based on the drug court model, have been implemented across the United States (Marlowe, Hardin, & Fox, 2016; National Institute for Justice, 2017). As drug courts have expanded they have sought to continuously refine their model through the integration of proven criminological and psychological theories, the development of evidence-based operational frameworks, and by measuring effectiveness based on the use of evaluation.

Theoretical Construct of Drug Courts

Since their inception in 1989, drug courts have continuously evolved and have come to embrace the concepts of therapeutic jurisprudence, procedural fairness, and risk-need responsivity as three foundational theories driving the drug court model (Kaiser & Holtfreter, 2016; Latessa & Reitler, 2015; Longshore et al., 2001; Stinchcomb, 2010). These theories influence programming decisions within drug courts and have been operationalized through guiding documents published by the National Association of Drug Court Professionals (1997, 2011, 2013, 2015).

Therapeutic jurisprudence.

In 1987, the theoretical model of therapeutic jurisprudence was introduced in criminal justice and legal literature (Stolle, Wexler, & Winick, 2000; Wexler & Winick, 1996, 2003). The concept of therapeutic jurisprudence reframes traditional thinking about the law as a set of impersonal rules that provides structure to society and instead considers the impact the law has on the psychological and behavioral well-being of the individuals who participate in the court

process and are affected by court rulings (Madden & Wayne, 2001; Saltzman & Proch, 1990; Wexler, 1996). In doing so, the court contemplates both short- and long-term consequences of a decision when determining the legal ruling that will be made for the party(s) before the court (Wexler & Winick, 2003).

Therapeutic jurisprudence assumes an interdisciplinary perspective toward the application of the law, in which the law can become a tool for applying psychological and behavioral modification principles to minimize counter-productive effects of a court ruling and increase the therapeutic potential for positive change (Freckleton, 2008; Slobogin, 1995; Stolle, Wexler, & Winick, 2000). This approach transformed thinking about the role of the court as a formal government mechanism for dispute resolution into an agency that can resolve both issues of fact and have meaningful influence on the underlying human issues responsible for bringing parties into the court (Freckleton, 2008; Schopp, 1999; Winick, 2002, 2003).

Procedural fairness.

Procedural fairness (also known as procedural justice) was introduced as a formal theoretical framework following accumulated research that consistently showed that the manner in which disputes are handled by the courts has an important influence upon peoples' evaluations of their experiences in the court system (Lind & Tyler, 1988). Furthermore, a person's perceptions of the courts have been found to be influenced more by the sense of being treated fairly, than the outcome of a case, even if that outcome is not in the person's favor (Burke & Leben, 2007; Tyler, 1996).

Research has concluded that procedural fairness is realized when certain behaviors occur between a lay person and a person of authority (Petrucci, 2003; Rottman, 2007; Tyler, 2006). In

the context of the courts (and drug courts), a person will experience elements of procedural fairness as listed in Table 1.

Table 1

Elements of Procedural Fairness

Voice:	The opportunity to tell their side of the story, explain their situation/views, or have their stories told to an authority who listens carefully.
Neutrality:	Legal principles are consistently applied and decisions are clearly explained by the court. There is an understanding of how the decision-making process works.
Respect:	The feeling of being treated with politeness, dignity, and respect, and know that their rights are protected and respected.
Trust:	Behavior or actions that indicate they can trust the character and sincerity of those in authority (e.g., they look for conduct that is benevolent, caring, seeking to do right).

Kaiser & Holtfreter, 2016; MacCoun, 2005; Warren, 2000

Risk-need-responsivity.

Risk-Need-Responsivity (RNR) is a strategy for working with criminal offenders that was developed during the 1980's and formalized in 1990 by Canadian criminologists James Bonta and Don Andrews (Andrews, Bonta, & Hoge; 1990; Bonta & Andrews, 2007). RNR has since been heavily researched, guided the development of risk assessment tools, heavily influenced the shift toward rehabilitation in the criminal justice system, and guided the type and intensity of treatment programs for criminal justice involved individuals (Andrews, Bonta, & Wormith, 2006; Bonta & Andrews, 2007). The essence of RNR is that intensity of supervision and treatment programs for criminal offenders must be appropriate for the level of risk posed by the offender to maximize therapeutic benefit (Andrews, Bonta, & Wormith, 2011; Lowenkamp, 2006; Ward, 2007). As suggested by its name, the RNR model is composed of three principles: (1) risk principle, (2) need principle, and (3) responsivity principle.

Risk principle (who should be treated)

In RNR, risk refers to the probability that a person will recidivate. The risk principle asserts that criminal behavior can be reliably predicted and that treatment should match an offender's risk to recidivate (Bonta & Andrews, 2007). Research has refined the risk principle to include three proven elements; (1) programs need to target offenders with the highest probability of failure; (2) these high risk offenders require the most intensive treatment services; and (3) that over treating lower risk offenders can actually have negative effects and increase a low-risk offender's likelihood to recidivate (Latessa & Reitler, 2015).

Need principle (what should be treated)

The need principle suggests the importance of meeting criminogenic needs in the design and delivery of treatment. Criminogenic need is determined through assessment of static risk factors (factors that don't change, such as a person's criminal history and type of offenses committed) and dynamic risk factors (those that can change over time, such as attitudes, values, peer groups, education, and employment.) that are directly linked to criminal behavior (Andrews, Bonta, & Wormith, 2006; Bonta & Andrews, 2007, Latessa & Reitler, 2015).

Responsivity principle (how treatment should be administered)

The responsivity principle describes how treatment should be provided and that the intensity of supervision and delivery of services should maximize the offender's ability to learn from a rehabilitative intervention by providing cognitive behavioral treatment and tailoring the intervention to the learning style, motivation, abilities and strengths of the offender (Bonta & Andrews, 2007; Andrews, Bonta, & Wormith, 2006; Latessa & Reitler, 2015).

Operational Framework for Drug Courts

The theories of therapeutic jurisprudence, procedural fairness, and risk-need-responsivity have heavily influenced the development of the drug court model. In conjunction with extensive research and evaluation identifying effective programmatic elements, these theories have been operationalized into professional documents that guide drug court professionals in their day-to-day work. As research has become more conclusive, the guiding documents have evolved beginning with the 10 Key Components of Drug Courts (NADCP, 1997) the Seven Essential Design Features (NIJ, 2011), to the recently published two volume, Adult Drug Court Best Practice Standards (NADCP, 2013, 2015).

10 key components of drug courts.

The 10 Key Components of Drug Courts was authored in 1997 and was the first substantial document written to describe the fundamental elements that define drug courts. Because of the novelty of drug courts at the time, and limited research on them, the document was meant to create a flexible framework and provide general and guidance on how to start a drug court (NADCP, 1997). The purpose of each key component is explained in the manual and followed by several performance benchmarks that give guidance for implementing each key component (NADCP, 1997).

The 10 key components are: (1) drug courts integrate alcohol and other drug treatment services with justice system case processing; (2) using a non-adversarial approach, prosecution and defense counsel promote public safety while protecting participants' due process rights; (3) eligible participants are identified early and promptly placed in the drug court program; (4) drug courts provide access to a continuum of alcohol, drug and other related treatment and rehabilitation services; (5) abstinence is monitored by frequent alcohol and other drug testing; (6)

a coordinated strategy governs drug court responses to participants compliance; (7) ongoing judicial interaction with each drug court participant is essential; (8) monitoring and evaluation measure the achievement of program goals and gauge effectiveness; (9) continuing interdisciplinary education promotes effective drug court planning, implementation, and operations; (10) forging partnerships among drug courts, public agencies, and community-based organizations generates local support and enhances drug court effectiveness (NADCP, 1997).

Seven program design features.

The Seven Program Design Features emerged out of collaborative research review funded by the Bureau of Justice Assistance and the National Institute for Justice, and executed in partnership with the National Center for State Courts and American University (National Institute of Justice, 2011). The seven program design features marked the first research based guidance on how a drug court should be structured and operate. Each design feature incorporated research based recommended practices and specific performance indicators. The seven design features addressed: (1) Screening and assessment; (2) target population; (3) procedural and distributive justice; (4) judicial interaction; (5) monitoring; (6) treatment and other services; (7) relapse prevention, aftercare, and community integration (National Institute of Justice, 2011).

Adult drug court best practice standards, volume I & II.

The adult drug court best practice standards were released in 2013 (volume I) and 2015 (volume II). These standards represent the most current and sophisticated set of guidance for drug court professionals. The authoring of the standards took over two years and went through stringent peer review by subject area experts for each standard. There are currently ten standards, each rising to the level of being evidence-based, and each is benchmarked with

research based recommended practices and specific performance indicators (NADCP, 2013 & 2015). The best practice standards are: (1) Target Population; (2) Equity and Inclusion; (3) Roles and Responsibilities of the Judge; (4) Incentives, Sanctions, and Therapeutic Adjustments; (5) Substance Use Disorder Treatment; (6) Complementary Treatment and Social Services; (7) Drug and Alcohol Testing; (8) Multi- disciplinary Team; (9) Census and Caseloads; (10) Monitoring and Evaluation.

Concepts and Methods of Research and Evaluation

Research and evaluation are critical processes for validating theories, generating new knowledge, and designing, implementing, and sustaining effective programming (Leeuw, 2005; NCJA, 2017). Research and evaluation are terms often used interchangeably, and while there are similarities and areas of overlap, there are also nuanced differences in concept, purpose, and scope of outcomes (Mathison, 2007; Rogers, 2014). The purposes of research and evaluation are summarized in Table 2.

Table 2

Comparing research and evaluation

Research	Evaluation
Seeks to generate new knowledge.	Seeks to provide information for decision-making.
Purpose is testing theory and producing generalizable findings.	Purpose is to determine the effectiveness of a specific program or model.
Researcher-focused. Questions to be answered originate with scholars in a discipline.	Stakeholder-focused. Questions originate with key stakeholders and primary intended users of evaluation findings.

Tests a hypothesis and more abstract questions (e.g., what motivates an offender to change; how does drug use effect the likelihood of recidivism, etc.).	Answers specific questions (e.g., is the program or policy achieving its goals or objectives; what is the impact of the program on reducing recidivism or saving money, etc.).
Quality and importance judged by peer review in a discipline. Strive for publication in academic journal.	Quality and importance judged by those who will use the findings to take action and make decisions. Publications for stakeholder review.
Test of value is the contribution of new knowledge within a field of study.	Test of value is usefulness to improve the program studied and guide decision-making.
The purpose of research is to prove.	The purpose of evaluation is to improve.

Levin, 2003; Mathison, 2007; NCJA, 2017; Stufflebeam, 2007

Drug courts have been both heavily researched and evaluated, using many different research designs and evaluation approaches since their inception. The following approaches have been fundamental to assessing drug court effectiveness.

Types of Evaluation.

There are many ways a program can be evaluated. The more common frameworks that have been used to evaluate drug courts are process, economic, impact, and outcome evaluations.

Process evaluation.

Process evaluations seek to determine how well a program is being implemented, or was implemented, contrasted to the intended program design. Process evaluations generally include documenting actual program performance and fidelity to a program model, identifying barriers to implementation, assessing how well specific services and/or interventions are being delivered, and other descriptive characteristics of the program (Carey & Zil, 2016; CDC, 2001; Giacomazzi & Bell, 2007; Steckler & Linnan, 2002).

Economic evaluation.

Economic evaluation measures the costs associated with the outcomes produced by a program. There are different forms of economic evaluations that can be used to assess direct costs of a program, comparative costs between different programs with similar outcomes, and costs-saved as a result of benefits from running a program (Belenko, 2005; CDC, 2001; Henrichson, & Rinaldi, 2014; SAMHSA, 2012)

Cost analysis.

A cost analysis is a comprehensive accounting of all expenses related to operating a program. The results simply identify how resources are being allocated and expended to run a program (CDC, 2001; Henrichson & Rinaldi, 2014; SAMHSA, 2012).

Cost-effectiveness analysis.

A cost-effectiveness analysis is a method of evaluating the costs of two different programs, relative to their outcomes, and to determine which option produces the desired outcome for the lowest cost. Cost-effectiveness studies can only be used when measuring different programs that have the similar outcomes (e.g., recidivism costs associated with drug court versus traditional probation) (CDC, 2001; Henrichson, & Rinaldi, 2014; SAMHSA, 2012; Sanders et al., 2016).

Cost-benefit analysis.

A cost-benefit analysis evaluates the cost of running of a program against the financial benefits tied to the outcomes of the program (e.g., drug court) and contrasts them to the costs and benefits generated by an alternative, but similar program (e.g., traditional probation). Rather than measuring comparative fiscal savings, the analysis monetizes the outcome benefits of the program (e.g., reduced recidivism, reduced victimization, reduced staff time, increased

employment, etc.) (CDC, 2001; Downey & Roman, 2014; Henrichson, C., & Rinaldi, 2014; SAMHSA, 2012).

Outcome and impact evaluation.

The terms “outcome” and “impact” are commonly seen in the literature, but despite nuanced differences, are often used interchangeably as these terms have not been formally standardized based on research designs used in a study (Cheesman, 2018). Both outcome and impact evaluations are concerned with cause-and-effect relationships between a program and its short- and long-term outcomes and the influence of program processes on short- and long-term outcomes (Cheesman, Broschius, & Kleiman, 2018). In the context of drug courts, outcome and impact evaluations most commonly measure recidivism and explore the program components (e.g., drug tests administered, type of treatment used, etc.) that have significant effect on the outcomes (e.g., reductions in recidivism, days incarcerated, new substance use, etc.). Outcome and impact evaluations may also measure the “value added by a program” through the use of experimental or quasi-experimental research designs comparing a new program or intervention (drug court) to an existing program of a similar nature (traditional probation). (Cheesman, F., 2011, 2012; GAO 2011b; Heck & Thanner, 2006; Kennedy & Klute, 2015; GAO 2011b).

Advanced Research and Evaluation Techniques

Advanced techniques have also been used to synthesize the findings of multiple independent drug court evaluations. Meta-analyses, systematic reviews, and narrative reviews use rigorous statistical procedures and descriptive review frameworks to determine aggregate effect of multiple drug courts and describe program characteristics.

Meta-analysis.

Meta-analysis is an advanced statistical procedure that yields a conservative and rigorous estimate of the average effects of an intervention (e.g., drug court) compared to standard treatment (e.g., traditional probation). The process involves systematically reviewing research literature, selecting studies that are scientifically acceptable according to standardized rating criteria, controlling for bias and variations between the included studies, and statistically averaging the effects of the intervention across all included studies (Becker, 2017; Lipsey & Wilson, 2001; Petrosino, 1995).

Systematic review.

Systematic reviews use detailed and comprehensive search methods for locating all published literature about a particular topic, appraising the studies located against pre-defined inclusion criteria (normally based on the quality of a research design and scope of findings), and then synthesize and summarize the findings of the studies (Farrington & Petrosino, 2001). Unlike meta-analyses, that provide a single index measure (effect size) for impact/outcomes, systematic reviews and narrative reviews (see below) do not attempt this and normally only present a summary of the findings from the qualified studies (Cochrane, 2017; Petticrew & Roberts, 2006).

Narrative review.

Narrative reviews summarize content and outcomes from multiple studies about a specific topic, but unlike systematic reviews do not have pre-determined criteria for selecting studies for review (Cipriani & Geddes, 2003; Collins & Fauser, 2005; Educational Research Review, 2007). Unlike systematic reviews, search criteria for studies included in a narrative review are not rigorously pre-defined. Furthermore, findings are considered to be subjective and are normally presented as qualitative and descriptive findings that are related to existing

theoretical models or frameworks in a field of study (Cipriani & Geddes, 2003; Collins & Fauser, 2005).

History of Drug Court Research and Evaluation

Drug Courts have become one of the most researched programs in the social sciences (Marlowe, 2016). Numerous individual drug court evaluations, meta-analyses, systematic reviews, and multi-site studies, have yielded compelling evidence that drug courts “work” better than traditional probation at reducing recidivism and saving money (Marlowe, Hardin, & Fox; 2016). Furthermore, research has driven the development of the drug court model and defined the programmatic elements of drug courts (NADCP, 1997, 2013 & 2015; NIJ, 2011).

Doug Marlowe (2006) asserts that there are three broad stages of research that occur in criminal justice programming and that have occurred in the drug court literature:

- 1. Effectiveness research* – The first generation of research determines whether a program is effective, on average, at reducing crime and producing other important benefits, such as reducing substance use and improving participants’ psychosocial functioning. In addition, cost-effectiveness studies determine whether the program produces a favorable financial return on investment for taxpayers.
- 2. Best practices research* – The second generation of research determines which participants reap the greatest benefits from the program (target population) and which practices produce the most effective and cost-effective results (best practices). Best practice studies indicate *how* and *why* a program works.

3. *Implementation research* – The third generation of research identifies effective methods of training, technical assistance, and quality assurance to ensure programs serve the appropriate target population and apply best practices to achieve the most effective and cost-effective results.

Adult drug courts have reached the third generation of research. More than 25 years of research and evaluation have demonstrated adult drug courts are effective (at reducing recidivism), are cost-effective, have a defined target population to maximize results, and have identified practices proven to yield positive outcomes (Centre for Justice Innovation, 2015; Marlow, Hardin, & Fox, 2016). Research and evaluation leading to this point has been extensive, as summarized in Table 3.

Table 3

List of meta-analyses, systematic reviews, and multi-site evaluations

Meta Analyses	Recidivism	Cost	Program Elements	Jail / Prison	Substance Use
Lowenkamp et al., 2005	x				
Wilson et al., 2006	x				
Latimer et al., 2006	x				
Aos et al., 2006	x	x			
Shaffer, 2006, 2011	x		x		
Drake, 2009	x	x			
Downey, 2010		x			
Drake, 2012		x			
Lee, 2012	x	x			
Mitchell et al., 2012	x				
Sevigny et al., 2013				x	
WSIPP, 2017	x	x			

Systematic Reviews	Recidivism	Cost	Program Elements	Jail / Prison	Substance Use
Belenko, 1998	x	x			
Belenko, 2001	x	x			
Roman, 2003	x				
GAO, 2005	x				
Carey, 2008	x	x	x	x	
Brown, 2010	x				
GAO, 2011a	x				
Carey, 2012	x	x	x	x	
Wittouck, 2013					x

Multi-Site Studies	Recidivism	Cost	Program Elements	Jail / Prison	Substance Use
Bhati et. al., (2008)		x			
Rossman et al., (2011)	x	x	x	x	x

Additionally, numerous studies have examined predictors of success in drug court and subsequent recidivism (Deschenes, 2009; Gallagher, 2014a, 2014b; Gill, 2016; Hartley, 2001; Hickert, 2009; Jewell, 2017; Listwan, 2003; Peters, 1999; Zweig, 2012) and have examined numerous factors including motivation (Cosden, 2006), drug of choice (Listwan, 2009; Taylor, Patra, & Gliksman, 2009), courtroom behavior (Reingle, 2012), gender (Messina, 2012; Shaffer, 2009), race (Dannerback, 2006; DeVall, 2012; Finigan, 2009; Gallagher, 2013a; Grella, 2008; McKean, 2011; Vito, 1998), mental health (Gray, 2005; Mattson, 2012; Mendoza, 2013; Peters, 2012), treatment (Frei, 2013; Peters, 2001; Sloan, 2013; Taxman & Bouffard, 2005), and risk-factors (Koetzlel, 2015; Latessa, 2015) as predictors of drug court success, failure, and recidivating.

Critical Response to Drug Court Research

Considerable emphasis has been placed on drug court research and evaluation, and the ability to prove that drug courts reduce recidivism compared to traditional probation practices. However, amidst the positive attention associated with the outcomes of drug court research, and the conclusion that drug courts are more effective at reducing recidivism than traditional probation, there has been a consistently critical record of concern about the methodological quality of the evaluations performed and consequential concerns about the accuracy of the outcomes. Common criticisms throughout the literature highlight poorly constructed comparison groups with limited statistical controls for bias (e.g., the comparison of graduates to terminations only, not controlling for time-at-risk, etc.), varied definitions of recidivism and presentations of recidivism findings, concerns with data quality and limited use of data sources for gathering recidivism data, lack of distinction between in- and post-program recidivism, short time periods for tracking recidivism, and limited understanding of the effects of drug court on long-term post-program recidivism (Belenko, 2002; Cooper, 2003; DeMatteo, Filone, & LaDuke, 2011; Devall, Gregory, & Hartmann, 2017; GAO, 1997, 2002, 2005, 2011; Giacomazzi & Bell, 2007; Gutierrez & Bourgon, 2012; Indermaur & Roberts, 2003; Jensen & Mosher, 2006; Jewell et al., 2016; Johnson & Wallace, 2004; Lilley, 2013; Merrall & Bird, 2009; Mitchell et al., 2012a, 2012b; Sanford & Arrigo, 2005; Rempel, 2005; Roman, Townsend, & Bahti, 2003; Wilson et al., 2006; Wiseman, 2005).

Gaps in the Literature

Although there are many unique challenges to performing research and evaluation of criminal justice programs (Farrington, 2006; Knaap et al, 2008; Leeuw, 2005; Lum & Yang, 2005; Welsch et al., 2011) two questions that remain unexplored in the literature is why the drug

court field continues to produce independent drug court outcome evaluations that draw criticism for lack of methodological rigor and what steps can be taken to remedy this persistent issue.

Methods

This paper uses a narrative review methodology to explore why criticisms of drug court outcome evaluations measuring recidivism persist and to consider steps that can be taken to improve the quality of drug court outcome evaluations measuring recidivism.

To achieve this, the following documents were reviewed: (1) technical advisories published for drug court professionals; (2) selected studies included in meta-analyses, commonly cited by the National Association of Drug Court Professionals, to examine differences in the construction of match-groups and variables used, how recidivism is defined and findings presented, and the time windows for measuring recidivism, and recidivism data sources used; and (3) Adult Drug Court Best Practice Standard “Monitoring and Evaluation.”

Review of Technical Advisories for Drug Court Professionals

The Bureau of Justice Assistance, National Institute of Justice, American University, Center for Court Innovation, National Association of Drug Court Professionals (National Drug Court Institute), and the National Center for State Courts are the lead agencies that provide technical assistance to drug court professionals across the United States. The website of each agency was reviewed for content related to drug court evaluations, and each agency was contacted by e-mail and phone to gather all available professional publications, videos, webinars, and other training materials/conference presentations related to drug court evaluation.

Review of Adult Drug Court Studies Included in Meta-Analyses

Results of meta-analyses measuring recidivism are regularly cited in academic literature and by the NADCP in their recurring publication “Painting the Current Picture: A National Report on Drug Courts and Other Problem-Solving Courts in the United States (Huddleston, Marlowe, & Casebolt, 2008; Huddleston & Marlowe, 2011; Marlowe, Hardin, & Fox, 2016). Nineteen drug court evaluations, using quasi-experimental designs, were selected for review from meta-analyses performed by Lowenkamp et al. (2005), Wilson et al. (2006), Latimer et al. (2006), Aos et al. (2006), Shaffer (2006), Mitchell et al. (2012), and the Washington State Institute for Public Policy (2017).

Review of Adult Drug Court Monitoring and Evaluation Best Practice Standard

Adult Drug Court Monitoring and Evaluation Best Practice Standard was reviewed to discern what guidance is provided about the construction of match-groups and variables used, how recidivism is defined and findings presented, the time windows for measuring recidivism, measures of recidivism used in outcome evaluations measuring recidivism, and data collection strategies.

Findings

Findings reveal limited published guidance for performing drug court outcome evaluations measuring recidivism and considerable differences amongst evaluations regarding variables used for matching, definitions of recidivism, and presentation of recidivism findings.

Finding 1: No technical advisories or professional guidance has been published related to recidivism evaluations for drug court professionals and evaluators

Since the late 1990’s there have been numerous technical assistance documents and webinars published for drug court practitioners and researchers. However, none of these have

addressed data needs, data collection strategies, and other considerations unique to performing outcome evaluations measuring drug court's impact on recidivism.

Finding 1a: results from a review of publications.

Three technical advisories related to measuring recidivism were found to have been published for drug court professionals (Cheesman, Rubio, & Federspiel, 2008; Johnson & Wallace, 2004; Rempel, 2005). The advisory published by Johnson and Wallace provides broad considerations for research design, whereas Rempel's advisory considers how recidivism may be defined and discusses approaches to statistical matching (including propensity score matching). Cheesman, Rubio, and Federspiel surveyed nine states and summarizes that each state defines, measures, and tracks recidivism differently. Furthermore, none of these advisories enumerates minimum or recommended data required to evaluate a drug court's impact on recidivism.

Two technical advisories related to performance measurement were found to have been published for drug court professionals. Both publications focused on program level data that drug courts should collect; however, they did not address data needs or research design for recidivism evaluations (Cheesman, 2008; Heck, 2006).

No technical advisories have been published for drug court professionals related to cost-effectiveness studies; however, one publication was found that discussed data collection and execution of cost-benefit analyses for drug courts (Downey & Roman, 2014). Two technical advisories that discussed in detail how to measure costs and benefits in criminal justice and substance abuse treatment programs were found (Henrichson & Rinaldi, 2014 & SAMHSA CSAT), and one report was published describing a framework for measuring drug court cost-effectiveness was found (Crumpton, Carey, & Finigan, 2004).

Finding 1b: results from a review of recent conference presentations.

The National Association of Drug Court Professionals (NADCP) Annual Training Conference is considered to be the world's largest conference on addiction, mental health, recovery, treatment courts, and criminal justice reform (NADCP, 2018). Three conference presentations in 2016 addressed program level data collection and evaluation types, however, did not address needs unique to performing a recidivism study (Carey & Zil, 2016; Chessman, 2016; Mackin & Carey, 2016). Two conference presentations in 2017 discussed propensity score matching and considerations for data collection in a recidivism evaluation; however, were limited in scope (Brown, et al., 2017; Swayze & Johnson, 2017).

Finding 1c: results from a review of webinars and other media.

The Bureau of Justice Assistance and National Institute of Justice co-funded a collaborative Adult Drug Court Research to Practice initiative in 2012. A published website hosts webinars and training modules on a number of different drug court topics (all content from this webpage was also published to DVD and is regularly distributed at NADCP annual training conferences). There are specific webinars addressing cost-efficiency, process, outcome, and impact evaluations (Cheesman, F., 2012). Additionally, the Center for Court Innovation has several webinars addressing performance measurement and data collection (Cheesman, 2011; Sisario, 2011). However, none of the webinars or accompanying powerpoint slides addressed data to be collected or other design considerations unique to performing a recidivism study.

Finding 2: Review of independent evaluations included in drug court meta-analyses revealed duplicative inclusion in meta-analyses, and significant variance in research design and reporting of outcomes among independent evaluations

Nineteen independent evaluations of adult drug courts using quasi-experimental designs were selected for review from meta-analyses performed by Lowenkamp et al. (2005), Wilson et al. (2006), Latimer et al. (2006), Aos et al. (2006), Shaffer (2006), Mitchell et al. (2012), and the Washington State Institute for Public Policy (2017).

Finding 2a: results from a review of meta-analyses (part 1).

A total of 144 individual evaluations (Table 4) of drug courts using quasi-experimental designs were identified from the seven meta-analyses (citations for each evaluation and the meta-analysis it appeared in is listed in Appendix A).

Table 4

List of meta-analyses reviewed and the number of quasi-experimental evaluations included

Author	Year Published	# Studies Included
Lowenkamp	2005	19
Wilson	2006	53
Latimer	2006	44
Aos	2006	38
Shaffer	2006	42
Mitchell	2012	93
WSIPP	2017	51
		144

A surprising finding from the review of the meta-analyses was the extent to which each meta-analyses included the same evaluations as summarized in Table 5.

Table 5

Summary of evaluations included in meta-analyses

Studies included in only one Meta-Analysis (n=65)(45%)	Studies included in more than one meta-analysis (n=79)(55%)	
34 Mitchell (2012)	38	Included in 2 studies
7 WSIPP (2017)	5	Included in 3 studies
24 All other studies	12	Included in 4 studies
	10	Included in 5 studies
	7	Included in 6 studies
	7	Included in 7 studies

It was my professional assumption, and one likely shared by other non-research focused drug court professionals, that each meta-analyses used unduplicated evaluations. However, this is not the case and may be attributable to a lack of evaluations with enough breadth and rigor to qualify for inclusion in meta-analyses and the fact that all but two of the meta-analyses were performed and published in either 2005 or 2006. If unduplicated evaluations were included in each meta-analysis, approximately 400 individual drug court evaluations using quasi-experimental designs would have been uniquely studied.

Finding 2b: results from a review of meta-analyses (part 2).

Of the meta-analyses measuring drug courts' impact on recidivism, the most rigorous were performed by the Campbell Collaboration in 2006 (Wilson) and 2012 (Mitchell). Mitchell's meta-analysis used a highly structured and transparent review process, using the Maryland Scientific Methods Scale and standards unique to the Campbell Collaboration, to determine inclusion of evaluations in the meta-analysis, and to rank the included studies based on their methodological rigor: weak (18, 20%), standard (51, 55%), or rigorous (20, 22%) quasi-experimental design, or randomized (3, 3%).

Mitchell's meta-analyses also provides a summary of characteristics unique to the included studies. Features such as length of time recidivism was measured, if recidivism measures delineated in- and post-program recidivism, characteristics of the comparison groups, and a number of programmatic elements of drug courts (e.g., number of phases, frequency of drug testing, etc.) were reported on. However, what was not provided in detail, were which studies were ranked as weak, standard, or rigorous, matching techniques used, variables used in matching, recidivism definitions (e.g., all new arrests, all new convictions, etc.), and how recidivism results were presented (e.g., felonies only, summary offenses excluded, etc.). However, Mitchell indicates that there were considerable difference between evaluations in these areas.

Finding 2c: results from a review of selected evaluations in the meta-analyses.

Nineteen evaluations of individual drug courts were selected from the 144 drug court evaluations used in the meta-analyses. The evaluations chosen were published after 2000, appeared in four or more of meta-analyses or in both Mitchell's 2012 and WSIPP's 2017 meta-analyses, and were able to be located in academic journals and web searches. Table 6 summarizes characteristics of the evaluations in the areas of research design, selection of the comparison group, variables used in matching, statistical methods used for matching, controlling for time-at-risk, definition of recidivism, data sources used for recidivism data, how recidivism was measured (e.g., in-program or post-program), and the length of time recidivism was measured.

Table 6

*Characteristics of select evaluations used in multiple meta-analyses***Research Design**

Post-test only	16 (84%)
Pre-test / Post-test	3 (16%)

Case pool for selecting comparison group

Referred to drug court but did not enter (voluntarily, ineligible, rejected for other reasons)	7 (37%)
Retrospective cases (eligible but drug court didn't exist at the time)	3 (16%)
Eligible by instant offense (but not-referred and/or placed on normal probation)	8 (42%)
Criminal history also verified for eligibility	3 (16%)
Other case source / Not clearly explained	3 (16%)

Note – several studies used multiple pools for drawing names to create a matched-comparison group.

Variables Used in Matching

<i>Does not clearly indicate variables used</i>	1 (5%)
<i>Demographic</i>	
Age (at entry)	19 (100%)
Gender	19 (100%)
Race / Ethnicity	18 (95%)
Primary Language	1 (5%)
Marital status	6 (31%)

Note – Definitions of race and ethnicity were used interchangeably throughout the different evaluations. For example, Caucasian, Hispanic, African-American were labeled in some evaluations as race and others ethnicity.

Table 6 (continued)

*Characteristics of select evaluations used in multiple meta-analyses**Social Functioning*

Employment Status	5 (24%)
Income	2 (10%)
Education level	7 (37%)
Number of dependents	3 (16%)
Number of times moved in past 12 months	1 (5%)

Clinical

None	5 (24%)
DSM diagnosis	0 (0%)
ASAM level of care	0 (0%)
Proxy indicator of substance use (based on instant offense)	1 (5%)
Drug of choice	8 (42%)
Proxy indicator of alcohol use	2 (10%)
Proxy indicator of drug use	4 (21%)
Proxy indicator of mental health disorder	1 (5%)

Note – Several evaluations used multiple variables to demonstrate a substance use disorder between both groups.

Instant Offense

None	12 (31%)
Class of instant offense (e.g., drug, property, etc.)	6 (31%)
Severity of Instant Offense (e.g., felony or misd.)	1 (5%)

Risk Factors

None	0 (0%)
Risk assessment tool	1 (5%)
Proxy risk indicator	0 (0%)
Total criminal history	5 (24%)

Table 6 (continued)

*Characteristics of select evaluations used in multiple meta-analyses**Risk Factors (continued)*

Proxy (prior criminal history) (1=yes; 0=no)	1 (5%)
Proxy (prior record for drug related offense)	1 (5%)
Age at first arrest	1 (5%)
Partial criminal history (defined number of years before admission)	9 (47%)
Partial criminal history (select offense(s) e.g., drug, property, etc.)	11 (58%)
Prior Prison time	2 (10%)
Average jail days (defined number of years before admission)	3 (16%)

Note – Several evaluations used multiple variables for risk.

Matching Technique

None / does not clearly indicate tests used	2 (10%)
Bi-variate (t-test or chi-square per variable used)	17 (89%)
Propensity score matching	0 (0%)

Control for Time-at-Risk

Time-at-risk	4 (21%)
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Definition of Recidivism

All new arrests leading to conviction	2 (10%)
All new arrests	15 (80%)
All new convictions	2 (10%)

Table 6 (continued)

*Characteristics of select evaluations used in multiple meta-analyses***Recidivism Data Source(s)**

Local records only	4 (21%)
State Prosecutor records	1 (5%)
State Police records	10 (53%)
State Court records	3 (16%)
National Records (NCIC/CJCIS)	2 (10%)
Unknown / Not Stated / Unclear	1 (5%)
Describes scope of / limitations of data source used (e.g., only certain crimes reported, not all jurisdictions in the state report into the system, etc.)	0 (0%)

Recidivism Time Window

In-program only	1 (5%)
Overlap (in- and post-program)	13 (68%)
Post-program only	3 (16%)
Unclear / not specified	2 (10%)

Max length of time measured (including in-program)

Up to 12 months	1 (5%)
Up to 24 months	11 (58%)
Up to 36 months	3 (16%)
Up to 48 months	1 (5%)
Up to 60 months	1 (5%)
Unclear if in- or post-program recidivism measured	2 (10%)

Note – Two studies measured post-program recidivism only and are not included in this total. Two studies indicated a follow-up period of 24 months, however, did not clearly indicate when the follow-up period started (start of drug court or following discharge from drug court).

Table 6 (continued)

*Characteristics of select evaluations used in multiple meta-analyses***Length of Recidivism Post-Discharge Follow-up**

24 months	2 (10%)
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Note – only two evaluations measured post-program recidivism only. The majority of evaluations included both in- and post-program recidivism with the length of post-program recidivism varying from 0-36 months based on length of drug court evaluated and the number and length of time participants had been discharged from the drug court.

Presentation of Recidivism Findings*Level of new offenses*

New felony crimes	6 (31%)
New misdemeanor crimes	5 (24%)
Doesn't specify	11 (58%)

Category of new offenses

Property	11 (58%)
Person	9 (47%)
Controlled substances (drug)	12 (63%)
Violent/Weapon Offenses or Other offenses	2 (10%)
Doesn't specify	7 (37%)

Representation of new offenses

Odds/Probability	2 (10%)
% Comparison of new offenses between groups	13 (68%)
Annualized rate of new offenses	1 (5%)
Time to new offense (survival analysis)	3 (16%)
Average number of new offenses	9 (47%)
Cumulative number of new offenses	6 (31%)

Note – recidivism findings were presented in numerous ways across all evaluations. A number of evaluations did not differentiate recidivism between the type of re-offending (e.g., misdemeanor or felony or by crime group). The most common presentation of findings was a direct percent rate comparison between the drug court and matched-comparison group.

Review of the 19 evaluations revealed considerable differences between each in terms of evaluation design, variables used for matching, and presentation of recidivism findings. The majority of the studies used a post-test design only, bi-variate analyses for construction of matched-comparison groups with limited variables for clinical need or risk when matching, and did not differentiate between misdemeanor or felony charges when analyzing recidivism. While each evaluation yielded positive results (drug court participants generally recidivated less frequently and committed less serious offenses when they did), varying definitions of recidivism, and their subsequent presentation (aggregate presentation of all offenses versus more detailed examination of the nature and severity of new offenses) make it impractical to have an apples-to-apples comparison of outcomes between each study. The majority of the studies examined recidivism as a combined in- and post-program occurrence (24 months total), leaving only a 6-12 opportunity for post-program recidivism, which was not measured independent of in-program recidivism (which is not bad, but limits the understanding of a drug court's extended impact after the end of the program).

Finding 3: The Adult Drug Court Monitoring and Evaluation Best Practice Standard provides high-level guidance about evaluation design for measuring recidivism, but needs to provide more explicit guidance for data collection, establishing minimum standards for variables used in matching, and minimum standards for the presentation of recidivism findings

The Adult Drug Court Best Practice Standards (BPS), Volume II was released in 2015. BPS 10 “Monitoring and Evaluation” is the most current and comprehensive guidance published regarding drug court monitoring and evaluation for use by drug court professionals and evaluators. BPS 10 provides high level guidance on multiple aspects of drug court evaluation

and establishes clear guidelines about standards for record keeping, the creation of comparison groups, research design for measuring recidivism (intent-to-treat), and considerations for statistical controls when measuring recidivism in- and post-program (page 59):

H. Intent-to-Treat Analyses – Outcomes are examined for all eligible participants who entered the Drug Court regardless of whether they graduated, withdrew, or were terminated from the program.

I. Comparison Groups – Outcomes for Drug Court participants are compared to those of an unbiased and equivalent comparison group. Individuals in the comparison group satisfy legal and clinical eligibility criteria for participation in the Drug Court, but did not enter the Drug Court for reasons having no relationship to their outcomes. Comparison groups do not include individuals who refused to enter the Drug Court, withdrew or were terminated from the Drug Court, or were denied entry to the Drug Court because of their legal charges, criminal history, or clinical assessment results.

J. Time at Risk – Participants in the Drug Court and comparison groups have an equivalent opportunity to engage in conduct of interest to the evaluation, such as substance use and criminal recidivism. Outcomes for both groups are examined over an equivalent time period beginning from a comparable start date. If participants in either group were incarcerated or detained in a residential facility for a significantly longer period of time than participants in the other group, the length of time participants were detained or incarcerated is accounted for statistically in outcome comparisons.

BPS 10 broadly responds to concerns raised with drug court evaluations, and findings from the review of the 19 evaluations reviewed in this paper (as evidenced in the excerpt above and in further discussion throughout BPS 10). However, opportunity for refinement of BPS 10 exists as more explicit guidance for drug court coordinators and evaluators can be provided regarding data collection needs to ensure robust matching, conducting pre-test/post-design analyses, and controlling for time-at-risk during pre-, in-, and post-program time windows. Additional strategies can also be explored for defining processes for selecting matched-comparison groups, creating minimum standard presentation requirements for recidivism findings.

Conclusions and Recommendations

Based on findings from the previous section, the following conclusions and recommendations are offered for advancing the quality of drug court outcome evaluations measuring recidivism.

Conclusion 1: There is a lack of uniform standards and processes for creating matched-comparison groups, data collection, and for the measurement and presentation of recidivism findings. The considerable variation between evaluations has made the outcomes of drug court evaluations susceptible to criticism

As discussed in Findings 2 and 3, there has been significant variance in research design and reporting of outcomes among independent evaluations measuring drug courts' impact on recidivism. Furthermore, there has been a lack of explicit guidance for drug court professionals and evaluators to inform data collection, and establish minimum standards for variables used in matching and minimum standards for the presentation of recidivism findings.

Recommendation 1: Create baseline standards for constructing match-comparison groups, identify critical data to be collected, and establish uniform guidelines for defining and presenting recidivism findings

Recommendation 1a: Define a process for creating a rigorously constructed matched-comparison group using propensity score matching or a similar statistically-based matching procedure that adheres to an intent-to-treat research design.

Creating a rigorously constructed matched-comparison group is not an easy process. Poorly constructed matched-comparison groups have been a significant contributing reason to why so many drug court studies have been criticized for poor methods. Furthermore, it is the reason why many studies have been flawed to exclusion from the Campbell Collaboration's highly regarded meta-analyses or, if included were rated as being of weak methodological design (Mitchell, 2012).

Experimental vs. quasi-experimental research designs.

Experimental and quasi-experimental research designs are the two approaches most accepted for use in exploring cause-and-effect relationships. Experimental research is recognized as the “gold standard” as study participants have equal chance for random assignment to a treatment or control group (Weisburd, Lum, & Petrosino, 2001). However, random assignment, particularly in criminal justice research, is often not possible because of legal challenges, ethical issues, and procedural constraints unique to law enforcement agencies and the courts that limit acceptable processes for random assignment (Farrington & Welsh, 2005; Lum & Yang, 2005; Weisburd, 2000). Consequently, quasi-experimental research designs are often employed and members of a control group, who did not have an equal and random chance for placement in the treatment intervention, are selected based on characteristics most similar to the

people in the treatment group. However, unseen confounding influences may mask significant differences between participants in the control and treatment groups that must be controlled for (Weisburd, 2010). Without the use of rigorous statistical controls the potential for bias between the treatment and control groups is considerable, thereby skewing outcome results of an evaluation (often in favor the treatment group) (Farrington, 2003; Weisburd, Lum, & Petrosino, 2001; Welsh et al., 2011).

Matching in drug court quasi-experimental evaluations.

The purpose of matching is to obtain a comparison group that is as equivalent to the sample of Drug Court participants as possible with respect to variables that are known to influence outcomes and impacts. In an experimental design, this is accomplished by randomization but in a quasi-experimental situation, matching serves this function. The goal is to achieve equivalency on matching variables at the point the intervention commences (admission for Drug Court participants, date of sentencing for probationers), so that any differences observed between Drug Court participants and comparison group members when the intervention ends and during the follow-up period will be the result of the intervention (e.g., Drug Court vs. probation) and not some other (“confounding”) factor that is also related to outcomes. A rigorous statistical matching technique commonly used by researchers in other disciplines, but that has made a very limited appearance in drug court research and evaluation, is propensity score matching.

Propensity score matching was introduced in 1983 and is recognized as the most sophisticated statistical technique for creating matched-comparison groups in quasi-experiments (Beal & Kupzyk, 2014; Rosenbaum & Rubin, 1983; Shadish, 2012). Propensity score matching is able to statistically account for bias between the treatment and control group and assigns a

score that is the conditional probability that a person, in the control group, would have been assigned to the treatment group, based on selected variables (e.g., demographic, clinical, and risk variables) (Rosenbaum & Rubin, 1983; Beal & Kupzyk, 2014; Williamson & Forbes, 2014).

A proposed process for matching.

To begin the process of rigorously matching, one needs a robust pool of cases from which to create a match group, and quality data points (recommendation 1b) to build a valid and unbiased propensity score model.

Step 1 – create two pools of cases from which to create a match group.

Pool one (drug court pool) is all persons who have been, or are active, in drug court (must include participants who were both successful and unsuccessful). Pool two (match pool) is a list of all defendants who did not participate in drug court (ideally from the court's jurisdiction). The best case scenario is obtaining a list of all criminal defendants who had cases processed in the court during a range of years within the period defined by the dates of admission of your drug court sample. From this list, all instances of defendants who participated in drug court and defendants who were referred to drug court but did not enter (e.g., legally or clinically ineligible, eligible but voluntarily declined to participate) are removed. What remains is a pool of defendants from the court's jurisdiction that has been filtered to minimize self-selection bias and is ready to begin matching.

Step 2 – select variables for matching.

Variables selected for consideration in matching must be the same between drug court participants and non-drug court persons being matched to. Ideally, variables available for matching will include demographic variables, clinical variables (comparison group member should meet clinical criteria to enter the drug court), static risk variables, dynamic risk variables,

and social functioning variables at the time a person entered drug court or traditional probation (discussed more in recommendation 1b). All matching variables must then be tested for best fit in the propensity score model (e.g., ensure that variables are not multi-collinear). Not all variables that end up in the final propensity score model need to be statistically significant.

Step 3 – controls

During the matching process, steps must be taken to ensure: (a) that age at the time of offense a person entered drug court or traditional probation is accounted for; (b) a person's discharge status from the drug court or regular probation is not used in matching; (c) that a person from the match pool does not have an "entry offense" (equivalent offense that places them on probation) that would make them ineligible to participate in drug court; and (d) that a person from the match pool does not have offenses in their criminal history, before their equivalent entry offense, that would make them legally ineligible for drug court according to state drug court statutes and practices of the local prosecutor's office.

Step 4 – Filtering and re-matching.

Matching may take several rounds at the discretion of the evaluation team. Every matched case must be checked to ensure they have a charge that is an equivalent entry offense to drug court and that the criminal history of the matched case is reviewed to ensure legal eligibility. Cases that don't meet these criteria can be re-matched or removed from the study.

Recommendation 1b: Create a minimum standard data set of variables to collect for matching.

A robust set of variables for matching is important. Propensity score matching seeks to identify most similar characteristics between treatment and non-treatment groups. A drug court that is operating in accordance with the best practice standards will be able to collect a full

spectrum set of data that represents a person, including demographic, social functioning, clinical, and static and dynamic risk factors.

Unfortunately, effective matching is often limited to the lowest quality data available for the match group (this may be especially problematic with clinical data, where defendants on traditional probation are more likely to never receive a substance abuse assessment). A drug court that is operating with fidelity to the best practice standards will most likely always have a higher quality of set of demographic, clinical, and risk data. When selecting variables for matching it is important that variables be equivalent (same variables between groups), accurate (able to interpret meaning of variables), and complete (not missing data between both groups).

Based on elements of the best practice guidelines, drug courts should at minimum have the following variables available for matching, as listed in Table 7.

Table 7

Variables for consideration when matching

Demographic Variables	Corresponding Best Practice Standard
Age	1, 2
Race	1, 2
Ethnicity	1, 2
Gender	1, 2
Sexual Orientation / Identity	1, 2
Religion	1, 2
Social Functioning (at time of entry)	
Level of education	1
Employment Status	1
Number of children (dependent and not)	1
Annual income	1

Table 7 (continued)

Variables for consideration when matching

Clinical Variables	
Substance Use Diagnosis	1, 5
Mental Health Diagnosis	1, 5
ASAM Level of Care	1, 5
Risk Factors	
Static and dynamic risk variables will vary based on the risk assessment used. However, minimum standard data for static risk factors should exist and can be used in developing a proxy risk score (Bouge, Woodward, & Joplin, 2006)	
1. Age (at time of entry to drug court or traditional probation)	1, 10, & Vol. 1, Appendix A
2. Age of first documented law enforcement contact	
3. Total number of prior convictions	

Recommendation 1c: Create a standard definition of recidivism, its measurement, and statistical presentation, and describe data sources used to gather recidivism data.

A consistent definition of recidivism and the offenses used to measure recidivism needs to be established for drug court literature. The aim of a recidivism study is to measure the treatment effect (drug court intervention versus traditional probation) as accurately as possible; therefore, using the date that is most immediate to the occurrence of a criminal behavior is paramount for sound evaluation. The most precise definition of recidivism that accounts for the immediate instance of behavior deemed criminal and a person's constitutional due process rights is *"the date an investigation is opened or an arrest made that ultimately results in a conviction."*

When collecting data for recidivism it is important to focus on the instance of the criminal behavior. While some arrests are more likely to be concurrent with a criminal behavior

(e.g., drunk driving, retail fraud), some crimes may be reported and require investigation and issuance of an arrest warrant before an arrest is made (e.g., home invasion, breaking and entering, etc.).

Investigations or arrests alone should not be counted as recidivism. Although the person had contact with the criminal justice system, as a result of either direct or indirect circumstances (e.g., at a party, with known drug users, etc.), the facts of the event leading to investigation or arrest may not support a conviction for the alleged criminal behavior. Conversely, using the date of a guilty plea or sentence should be used with caution. Recidivism must be the closest sequential measure of a criminal behavior leading to a conviction. From the time a criminal behavior occurs to the time of guilty plea or sentencing, there are numerous procedural steps in the criminal justice system that can cause significant time (weeks and often months for felony cases) to lapse. There is considerable potential for this to skew actual instances of recidivism, as the date of a guilty plea or sentence may fall outside of a measured time-window for recidivism, but the actual behavior resulting in the investigation or arrest occurred inside the time window.

Measuring recidivism.

With a clear definition of recidivism, a drug court's impact on recidivism can be measured and reported in a number of different ways (the time window for measuring recidivism is discussed in recommendation 1d). Table 8 illustrates recommended ways of analyzing and reporting recidivism outcomes to be considered as minimum standard requirements in evaluation:

Table 8

Minimum standard presentation of recidivism findings

-
1. All new arrests resulting in conviction (hereby referred to as offenses).
 - a. All new violent vs. non-violent offenses
 - b. All new controlled substance, property, or person offenses
 2. All new felony offenses
 - a. All new violent vs. non-violent felony offenses
 - b. All new controlled substance, property, or person offenses
 3. All new misdemeanor offenses
 - a. All new violent vs. non-violent misdemeanor offenses
 - b. All new controlled substance, property, or person offenses
 4. All new traffic & summary offenses

Presentation of recidivism results.

Depending on the statistical tests used to analyze recidivism, results may be presented a number of different ways. At minimum, results should be presented as either an odds ratio (indicating the likelihood of recidivism), direct percentage impact on recidivism, or annualized rate of recidivism.

Recommendation 1d: Create standard and equivalent time windows for collecting recidivism data pre-admission, in-program, and post-discharge from drug court.

It is imperative that there are clearly defined and equivalent time-periods for measuring recidivism. There are three distinct time windows in which data should be collected for measuring drug court effectiveness: (a) pre-drug court; (b) in-program; and (c) post-drug court.

Drug court best practice standards suggest collecting data for three years from the start of drug court. However, attention is not given to distinguishing in-program and post-program recidivism, nor is attention given to the value of pre- and post-test comparisons (BPS Vol. II,

2015). A clearer standard is that offense data be collected before starting drug court and recidivism data be collected in-program (drug courts often vary in length and intensity, scope, and duration of services), and for three years from the date of discharge from the drug court. Evaluation analyses should clearly distinguish and analyze separately in-program and post-program recidivism. Using the recidivism definitions recommended in 1a and 1c, timelines for tracking offenses are:

Pre-drug court.

Offenses recorded pre-entry to drug court are determined by subtracting the start date of drug court from the dates of investigations opened or arrests made back 1,095 days (three years). The start date for drug court is defined as the date a person begins receiving services unique to the drug court (regardless if this begins pre- or post-plea or sentence). One may be admitted to drug court, but not start right away because of pre-trial detention, post-sentence program operations, post-sentence jail, or other reasons. Therefore, the start date that a person is on release in the community (or treatment setting) and must comply with drug court rules and programming should be used. If services occur while in jail, this should be controlled for as a time-at-risk covariate (see recommendation 1e).

In-program.

Offenses recorded as in-program offenses are the dates of investigations opened or arrests made between the start date of drug court and the date drug court services end (it is okay if the conviction is after the person is discharged, as the criminal behavior still occurred while active in drug court).

Discharge date from drug court is defined as the date a person no longer receives services unique to the drug court. If a person absconds, the date they abscond is the date they stopped

receiving services. Likewise, the date a person decides to withdraw from the drug court, or it is decided they will be terminated and the person stops receiving services, is the date drug court services end, even if several weeks or months elapse before a formal court proceeding confirming this. Some drug courts graduate people immediately when eligible; others hold graduation events spaced throughout the year. Again, when it is decided that a person will graduate and they stop receiving drug court services is the date to be used for discharge.

Post-drug court.

Offenses recorded as post-drug court are the dates of investigations opened or arrests made up to 1,095 days post discharge date from the drug court. For post-drug offenses, it is okay if the conviction is after the 1,095 day window, as the criminal behavior still occurred inside that time window.

Recommendation 1e: Create standard definitions and controls for measuring recidivism that account for a person being incarcerated, on probation/parole, or unrestricted by the criminal justice system in pre- in- and post-program time windows.

Time-at-risk is an established research concept that refers to the members of groups being studied (e.g., drug court versus traditional probation) having an equal opportunity, under comparable conditions, to engage in the behavior(s) being evaluated (e.g., committing a new crime). Time-at-risk has not been controlled for in the majority of drug court evaluations performed to date (as evidenced in finding 2c) and is now a required evaluation component articulated in BPS 10.

Time-at-risk may be calculated differently for pre-, in-, and post-program offenses for drug court participants and their matched-comparison counterparts. Additionally, within each window of time-at-risk, a person may either experience circumstances affecting their “time-at-

liberty,” such as incarceration (during which you cannot commit a crime), periods of being under the additional scrutiny of the court while on probation/parole (during which you may be more likely to be caught reoffending), or not being involved in the criminal justice system. In reaching inferential conclusions about the effectiveness of a drug court’s short- and long-term impact on recidivism, equivalency for these scenarios must be clearly defined and controlled for.

Suggested definitions for controls follow, and recommended data points to collect are listed in Appendix C.

Time in jail/prison.

Time in jail/prison refers to the time a person is incarcerated in jail or prison and unable to commit a new offense. For the time windows pre- and post-drug court, recorded instances of when a person was in jail or prison are needed each recidivating offense.

Time on probation/parole.

Time on probation/parole refers to the time that a person is in the community, but under probation supervision of the court (either for drug court or a recidivating offense). For the time windows pre-, in-, and post-drug court, recorded instances of when a person was on probation or parole for offenses is needed.

Time Unrestricted.

Time unrestricted refers to the time a person is not involved in the criminal justice system (not incarcerated or on probation/parole) during a time window for measuring recidivism.

Conclusion 2: The lack of any formal technical advisory in academic and professional literature, that guides the design, data collection, and presentation of recidivism findings for drug court has not allowed our profession to advance the quality of drug court evaluations measuring recidivism, thereby perpetuating long-standing concerns about the quality and outcomes of these evaluations

As discussed in Finding 1, no technical advisories have been published or presented that address data needs, data collection strategies, and other considerations unique to performing outcome evaluations measuring drug court's impact on recidivism.

Recommendation 2: Create a technical advisory for drug court professionals and evaluators, unique to the conduct of drug court evaluations measuring recidivism

Recommendation 2a: Content of the technical advisory addresses processes for creating matched-comparison groups, data collection, and the measurement and presentation of recidivism findings.

Criticism surrounding the methodological quality of drug courts evaluations has been a persistent concern in academic and professional literature. Standards for quality control of drug court research designs and data collection already exist in the criminal justice literature, however, have not been presented in a concise and easily accessible format for drug court professionals and evaluators.

The Bureau of Justice Assistance and their financially supported drug court technical assistance providers (National Association of Drug Court Professionals, American University, and the Center for Court Innovation) should convene an expert panel to create a technical advisory for drug court professionals and evaluators that addresses research design and data collection for drug court outcome evaluations measuring recidivism.

Minimum standard content in this advisory should include recommendations in the Adult Drug Court Monitoring and Evaluation Best Practice Standard, evaluation standards established by the Campbell Collaboration, incorporate the Maryland Scientific Methods Scale, and include recommendations from this paper (as discussed in recommendation 1 and Appendix B).

Recommendation 2b: Content of the technical advisory also includes an evaluation planning tool, unique to drug courts, that allows evaluators and drug court teams to collaboratively pre-plan a recidivism evaluation and work through the evaluation process.

Producing a quality evaluation of a drug court (or other specialty court) requires considerable coordination, time, and commitment of personnel and financial resources. A skilled evaluation team will be able to discuss research design and analytical techniques; however, a skilled drug court team is required to discuss data availability, data collection, and timelines for bringing data together. Working together through a joint planning process, evaluators and drug court teams can assess data availability, data collection, effectively plan the evaluation process, and budget for the evaluation.

Appendix C has a preliminary list of recommendations for evaluation planning, and I would recommend that a dedicated task force work to build on this. The Evaluation Center at Western Michigan University (www.wmich.edu/evaluation/checklists) has resources available for evaluation planning and would serve as an excellent starting point in developing evaluation planning materials tailored for drug courts (The Evaluation Center, 2018).

Epigraph

Drug courts are approaching their fourth decade of operation, yet they still face scrutiny from public funding agencies at the federal, state, and local levels, and combat criticism from skeptics in the criminal justice system. Furthermore, concerns persist about drug courts' ability to effectively reduce recidivism based on the methodological quality of the evaluations performed to date.

As discovered in this paper, minimal guidance has been made available to drug court professionals and evaluators as it relates to designing outcome evaluations that measure recidivism. Although the adult drug court monitoring and evaluation best practice standard has clearly prescribed essential elements necessary for more thorough evaluation of drug courts, further guidance is needed to inform data collection, establish common definitions and measures of recidivism, and enumerate minimum standard research designs and statistical testing for evaluating drug court impacts on recidivism.

The Adult Drug Court Monitoring and Evaluation Best Practice Standard is launching the drug court profession into the so-called "third generation" of criminal justice programs research. Combined with recommendations from the meta-analyses performed by the Campbell Collaboration, and recognized evaluation practices in other disciplines, this best practice standard can be further developed to assist drug court professionals and independent evaluators enhance the quality of drug court evaluations and research in the coming decade.

The drug court community has historically communicated and demonstrated a strong commitment toward continuous improvement. With the credibility and long-term security of drug courts resting on evaluation outcomes measuring recidivism, the field has an affirmative obligation to continue to take steps to improve the guidance available to drug court professionals

and evaluators. I hope that the findings and recommendations in this paper may serve as a starting point for creating a technical advisory about producing rigorous evaluations measuring drug court impact on recidivism, and that this advisory becomes available for drug court professionals and evaluators across the globe as we endeavor to continually improve the criminal justice system.

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Appendix A: studies included in meta-analyses

The following is a list of drug court evaluations, using quasi-experimental research designs, included in meta-analyses that study drug courts' impact on recidivism. The gray shaded box indicates the meta-analysis each evaluation appeared in. All citations have been adjusted to reflect current APA citation standards, and may not exactly match how they appear in the references for each meta-analysis (reference sections for each meta-analysis are included in this appendix). An asterisk denotes studies that were reviewed for this paper.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Alaska Judicial Council. (2005). *Evaluation of the outcomes in three therapeutic courts: Anchorage Felony Drug Court, Anchorage Felony DUI Court, Bethel Therapeutic Court*. Anchorage, AK: Author.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Alaska Judicial Council. (2007). *Recidivism in Alaska's felony therapeutic courts*. Anchorage, AK: Alaska Judicial Council.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Anspach, D. F. & Ferguson, A. S. (1999). Cumberland County's drug court program: An evaluation report of Project Exodus. Washington, DC: U. S. Department of Justice, Office of Justice Programs, Drug Courts Program Office.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Barnoski, R., & Aos, S. (2003). Washington State's drug courts for adult defendants: Outcome evaluation and cost-benefit analysis. Olympia, WA: Washington State Institute for Public Policy.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

*Bavon, A. (2001). The effect of the Tarrant County drug court project on recidivism. *Evaluation and Program Planning*, 24, 13-22.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Bedrick, B. & Skolnick, J.H. (1999). From "Treatment" to "Justice" in Oakland, California (From Early Drug Courts: Case Studies in Judicial Innovation, P 43-76, 1999, W. Clinton Terry, III, ed. -- See NCJ-179569)

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Bell, M.M. (1998). King County drug court evaluation (Final Report). Seattle, WA: M.M. Bell, Inc.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Bouffard, J. A., & Richardson, K. A. (2006). *Process and outcome evaluation of the South Central judicial district (Bismarck, ND) adult drug court*. Fargo, ND: North Dakota State University.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Breckenridge, J. F., Winfree, Jr., L.T., Maupin, J.R., & Clason, D. L. (2000). Drunk drivers, DWI 'drug court' treatment, and recidivism: Who fails? *Justice Research and Policy*, 2(1), 87.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

*Brewster, M. P. (2001). An evaluation of the Chester County (PA) drug court program. *Journal of Drug Issues*, 31(1), 177-206.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

*Brown, R. (2011). Drug court effectiveness: A matched cohort study in the Dane County Drug Treatment Court. *Journal of Offender Rehabilitation*, 50, 191-201.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Carey, S. M., Waller, J. M., & Roth, B. (2003). "Marion County Adult Drug Court Process Evaluation Final Report." Submitted to the Bureau of Justice Assistance, Office of Justice Programs, U.S. Department of Justice.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Carey, S. M., Waller, J. M., & Heiser, C. (2003). "Clackamas County Adult Drug Court Process Evaluation Final Report." Submitted to the Bureau of Justice Assistance, Office of Justice Programs, U.S. Department of Justice.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Carey, S. M., & Finigan, M. W. (2004). A detailed cost-analysis in a mature drug court setting: A cost-benefit evaluation of the Multnomah County drug court. *Journal of Contemporary Criminal Justice*, 20(3), 315-338.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

*Carey, S. M., & Finigan, M. W. (2007). *Indiana drug courts: Monroe County drug treatment court: Process, outcome and cost evaluation*. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Carey, S. M., & Finigan, M. W. (2007). *Indiana drug courts: St. Joseph County drug court program: Process, outcome and cost evaluation*. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Carey, S. M., & Finigan, M. W. (2007). *Indiana drug courts: Vigo County drug court process, outcome, and cost evaluation*. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Carey, S. M., & Finigan, M. W. (2007). Vanderburgh County day reporting drug court evaluation. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Carey, S. M., & Marchand, G. (2005). Marion County adult drug court outcome evaluation: Final report. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Carey, S. M., & Waller, M. S. (2007). Guam adult drug court outcome evaluation: Final report. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Carey, S. M., Waller, M., & Byrne, F. (2008). *California drug courts: Costs and benefits*. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

*Carey, S. M., Lucas, L. M., Waller, M. S., Lambarth, C. H., Linhares, R., Waller, J. M., & Finigan, M. W. (2009). *Vermont drug courts: Rutland County adult drug court process, outcome, and cost evaluation (Final Report)*. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Cheesman, F. L. II., Graves, S. E., Holt, K., Kunkel, T. L., Lee, C. G., & White, M. T. (2016). Drug court effectiveness and efficiency: Findings for Virginia. *Alcoholism Treatment Quarterly*, 34(2), 143-169.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Cissner, A. B. (2009). *The drug court model and persistent DWI: An evaluation of the Erie and Niagara DWI/Drug courts*. New York: Center for Court Innovation.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Cosden, M., Crothers, L., & Peerson, S. (1999). *Superior court of California County of Ventura: Drug court (Summary Findings)*. Santa Barbara, CA: University of California, Graduate School of Education.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Craddock, A. (2002). *North Carolina drug treatment court evaluation: Final report*. Washington, DC: U. S. Department of Justice, Office of Justice Programs, Drug Court Program Office.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Crancer, A. (2003). *An analysis of Idaho's Kootenai County DUI Court*. Unpublished manuscript.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Crumpton, D., Brekhus, J., Weller, J. M., & Finigan, M. W. (2003). *Cost analysis of Baltimore City, Maryland Drug Treatment Court*. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Crumpton, D., Brekhus, J., Weller, J. M., & Finigan, M. W. (2003). *Cost Analysis of Anne Arundel County, Maryland Drug Court*. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Deschenes, E. P., Cresswell, L., Emami, V., Moreno, K., Klein, Z., & Condon, C. (2001). *Success of drug courts in Orange County, California: Process and outcome evaluations*. Long Beach, CA: California State University Long Beach, Department of Criminal Justice.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Deschenes, E. P., & Greenwood, P. W. (1994). Maricopa County's drug court: An innovative program for first-time drug offenders on probation. *Justice System Journal*, 17, 55-73.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Deschenes, E. P., Iman, I., Foster, T. L., Diaz, L., Moreno, V., Patascil, L., et al. (1999). *Evaluation of Orange County Drug Courts*. Richmond, CA: The Center for Applied Local Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Deschenes, E. P., Iman, I., Foster, T., Castellonos, E., Ha, C., Michaels, K., & Ward, D. (2000). *Evaluation of Los Angeles County drug courts: 1994-1997*. Richmond, CA: The Center for Applied Local Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Ericson, R., Welter, S. & Johnson, T. L. (1999). *Evaluation of the Hennepin County Drug Court (Tech. Rep.)*. Minneapolis, MN: Minnesota Citizens Council on Crime & Justice.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Fell, J. C., Tippetts, A. S., & Langston, E. A. (2011). *An evaluation of the three Georgia DUI courts*. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Fielding, J. E., Tye, G., Ogawa, P. L., Imam, I. J., & Long, A. M. (2002). Los Angeles County drug court programs: Initial results. *Journal of Substance Abuse Treatment*, 23(3), 217-224.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Finigan, M. W. (1998). *An outcome program evaluation of the Multnomah County S.T.O.P drug diversion program*. Unpublished manuscript, State Justice Institute, Portland, OR.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Finigan, M. W., Carey, S. M., & Cox, A. (2007). *Impact of a mature drug court over 10 years of operation: Recidivism and costs*. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Fomby, T. B., & Rangaprasad, V. (2002). *DIVERT Court of Dallas County: Cost-Benefit analysis*. Dallas, TX: Southern Methodist University, Department of Economics.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Fuller, B., Carey, S. M., & Kissick, K. (2007). *Michigan DUI courts outcome evaluation: Final report*. Portland, OR: NPC Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Galloway, A. L., & Drapela, L. A. (2006). Are effective drug courts an urban phenomenon? Considering their impact on recidivism among a nonmetropolitan adult sample in Washington State. *International Journal of Offender Therapy and Comparative Criminology*, 50(3), 280-293.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Gilbertson, T. (Undated). *2008 DWI court evaluation report*. Bemidji, MN: Bemidji State University, Criminal Justice Department.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Gliksmann, L., Newton-Taylor, B., Patra, J., & Rehm, J. (2004). *Toronto drug treatment court evaluation project final report*. London, ON: Centre for Addiction and Mental Health, Social, Prevention and Health Policy.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Godley, M. D., Dennis, M. L., Funk, R., Siekmann, M. & Weisheit, R. (1998). *Madison County alternative treatment and court (Final evaluation report)*. Normal, IL: Lighthouse Institute, Chestnut Health Systems.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Goldkamp, J. S., & Weiland, D. (1993). *Assessing the impact of Dade County's felony drug court: Final report*. Philadelphia, PA: Temple University, Crime and Justice Research Institute.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Goldkamp, J. S. (1994). Miami's treatment drug court for felony defendants: Some implications of assessment findings. *The Prison Journal*, 73(2), 110-166.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Goldkamp, J. S., White, M. D. & Robinson, J. B. (2000). *Retrospective evaluation of two pioneering drug courts: Phase I findings from Clack County, Nevada, and Multnomah County, Oregon (Tech. Rep.)*. Philadelphia, PA: Temple University, Crime and Justice Research Institute.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Goldkamp, J. S., Weiland, D. & Moore, J. (2001). The Philadelphia treatment court, its development and impact: The second phase (1998-2000) (Tech. Rep.). Philadelphia, PA: Temple University, Crime and Justice Research Institute.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Goldkamp, J. S., White, M. D. & Robinson, J. B. (2001). Context and change: The evolution of pioneering drug courts in Portland and Las Vegas (1991-1998). *Law & Policy*, 23, 141-170.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Goldkamp, J. S., White, M. D. & Robinson, J. B. (2001). From whether to how drug courts work: Retrospective evaluation of drug courts in Clark County (Las Vegas) and Multnomah County (Portland)- Phase II report from the National Evaluation of Drug Courts (Tech. Rep.). Philadelphia, PA: Temple University, Crime and Justice Research Institute.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Goldkamp, J. S., White, M. D., & Robinson, J. B. (2001). Do drug courts work? Getting inside the drug court black box. *Journal of Drug Issues*, 31(1), 27-32.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Granfield, R., Eby, C., & Brewster, T. (1998). An examination of the Denver drug court: The impact of a treatment-oriented drug-offender system. *Law & Policy*, 20(2), 183-202.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Guerin, P., & Pitts, W. J. (2002). *Evaluation of the Bernalillo County metropolitan DWI/drug court final report*. Albuquerque, NM: Institute for Social Research, University of New Mexico, Center for Applied Research and Analysis.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Harrell, A., Cavanagh, S., & Roman, J. (1998). Findings from the evaluation of the D.C. superior court drug intervention program. Final Report. Washington, DC: The urban institute.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Harrell, A., Roman, J., & Sack, E. (2001). *Drug court services for female offenders, 1996–1999: Evaluation of the Brooklyn Treatment Court*. Washington, DC: The Urban Institute.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Harrison, L., Patrick, D., & English, K. (2001). *An evaluation of the Denver drug court: The early years 1995-1996*. Denver, CO: Colorado Department of Public Safety.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Harrison, R. S., Parsons, B. V., Byrnes, E. I. & Sahami, S. (no date). Salt lake County drug court evaluation report: July, 1996 through September, 1998 (Tech. Rep.). Salt Lake City, UT: University of Utah, Social Research Institute.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Harrison, R. S., Parsons, B. V., Eddings, S. K., Byrnes, E. I., & Sahami, S. (2001). *Salt Lake County drug court: Evaluation report September 1998 through September 2000*. Salt Lake City, UT: Intermountain Evaluation Services.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Hein, M. L. (2005). *Lancaster County adult drug court: An evaluation of the first three years*. Washington, DC: ISSED Solutions.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Hiller, M. Saum, C., Taylor, L., et al. (2009). *Waukesha Alcohol Treatment Court (WATC). Process and outcomes*. Philadelphia, PA: Temple University , Department of Criminal Justice.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Janikowski, W. R. (No Date). *Impact study of the Shelby County, TN drug court*. Memphis, TN: University of Memphis, Center for Community Criminology and Research.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Jobe, A. L. (2007). *The Douglas County adult drug court: Using recidivism rates as an indicator of long-term effectiveness* .Unpublished master's thesis, University of Nebraska, Omaha, NE.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Johnson, G. D., Formichella, C. M., & Bowers, D.A. (1998). Do drug courts work?: An outcome evaluation of a promising program. *Journal of Applied Sociology*, 15(1), 44-62.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Jones, R.K. (2011). *Evaluation of the DUI court program in Maricopa County, Arizona*. Washington, DC: U.S. Department of Transportation.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Kalich, D., & Evans, R. D. (2006). Drug court: An effective alternative to incarceration. *Deviant Behavior*, 27(6), 569-590.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Kobus, K. (2007). *Examining the impact of drug court participation for moderate and high risk offenders*. Unpublished master's thesis, University of Nevada Las Vegas, Las Vegas, NV.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

Krebs, C., Lindquist, C. H., Koetse, W., Lattimore, P. K. (2007). Assessing the long-term impact of drug court participation on recidivism with generalized estimating equations. *Drug and Alcohol Dependence*, 91, 57-68.

Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

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Lowenkamp 2005	Wilson 2006	Latimer 2006	Aos 2006	Shaffer 2011	Mitchell 2012	WSIPP 2017

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Appendix B: Data points to collect

The following is a summary list of processes, definitions, and data points as suggested in recommendations 3a-e, for both drug court participants and matched-comparison group members.

Recommendation 1a: *Define a process for creating a rigorously constructed matched-comparison group using propensity score matching and adhering to an intent-to-treat research design.*

Data for defendants referred to drug court, but found ineligible should be recorded. This data can help ensure that these defendants were not matched against when constructing a match group, thereby reducing self-selection bias (for those who voluntarily declined) and bias for defendants who were not legally or clinically eligible.

Table 1

Data to collect for defendants who were referred but did not enter drug court

Legally ineligible

Statutory determination (offenses defined in state drug court legislation)

Prosecutor determination (based on criteria used by local prosecutor's office that may be more detailed or restrictive than state legislation)

Clinically ineligible

Does not meet level of care

Needs exceed available services

Mental health (severe or persistent diagnoses)

Voluntarily declined to participate

Recommendation 1b: *Create a minimum standard data set of variables to collect for matching.*

Table 2

Variables for consideration when matching

	Corresponding Best Practice Standard
Demographic Variables	
Age	1, 2
Race	1, 2
Ethnicity	1, 2
Gender	1, 2
Sexual Orientation / Identity	1, 2
Religion	1, 2
Social Functioning (at time of entry)	
Level of education	1
Employment Status	1
Number of children (dependent and not)	1
Annual income	1
Clinical Variables	
Substance Use Diagnosis	1, 5
Mental Health Diagnosis	1, 5
ASAM Level of Care	1, 5
Cognitive functioning	1, 5
Risk Factors	
Static and dynamic risk variables will vary based on the risk assessment used. However, minimum standard data for static risk factors should exist and can be used in developing a proxy risk score (Bouge, Woodward, & Joplin, 2006)	1, 10, & Vol. 1, Appendix A
1. Age (at time of entry to drug court or traditional probation)	
2. Age of first documented law enforcement contact	
3. Total number of prior convictions	

Recommendation 1c: *Create a standard definition of recidivism, its measurement, and statistical presentation, and describe data sources used to gather recidivism data.*

Table 3

Suggested definitions of recidivism

Definition 1 (best):

The date an investigation is opened or an arrest made that ultimately results in a conviction.

Definition 2 (favorable):

Date of any new conviction (date of guilty plea)

Definition 2 (least favorable):

Date of any new conviction (date of sentencing)

Table 4

Dates to collect for measuring recidivism

*Dates of measurement	Drug Court	Traditional Probation
Date investigation is opened (leading to a conviction)	x	x
Date arrest is made (that leads to a conviction)	x	x
Date of Guilty Plea	x	x
Date of Sentencing	x	x

Note * – The date used must be the same between the drug court and traditional probation groups. Data sources should be listed and any limitations

Table 5

Minimum standard presentation of recidivism findings

-
1. All new arrests resulting in conviction (hereby referred to as offenses).
 - a. All new violent vs. non-violent offenses
 - b. All new controlled substance, property, or person offenses
 2. All new felony offenses
 - a. All new violent vs. non-violent felony offenses
 - b. All new controlled substance, property, or person offenses
 3. All new misdemeanor offenses
 - a. All new violent vs. non-violent misdemeanor offenses
 - b. All new controlled substance, property, or person offenses
 4. All new traffic & summary offenses

Table 6

Recidivism data sources

*Criminal History Data Sources	Drug Court	Traditional Probation
Local records (city/county)	x	x
Statewide records (state police)	x	x
State police		
State supreme court		
Other		
National records	x	x
NCIC		
Other		

Note * – Data sources used for recidivism instances must be the same for both drug court and traditional probation groups. Data sources should be listed and any limitations in records kept by the repositories explained. An ideal evaluation will include offenses that occurred statewide and out-of-state.

Recommendation 1d: *Create standard and equivalent time windows for collecting recidivism data pre-admission, in-program, and post-discharge from drug court.*

Table 7

Pre-program offenses for drug court and traditional probation defendants

Dates of measurement	Drug Court	Traditional Probation
*Date investigation is opened (leading to a conviction)	x	x
*Date arrest is made (that leads to a conviction)	x	x
*Date of Guilty Plea (in the court where sentencing occurs)	x	x
*Date of Sentencing	x	x
<hr/>		
**Start Date	x	x

Note * – The date used must be the same between the drug court and traditional probation groups. Pre-program is any of the dates listed above that occurs before a defendant starts drug court or traditional probation.

Note ** – Start date is defined as when a defendant is supervised and receiving drug court or traditional probation services in the community (time-at-liberty).

Table 8

In-program offenses for drug court and traditional probation defendants

*Dates of measurement	Drug Court	Traditional Probation
**Start Date	x	x
Date investigation is opened (leading to a conviction)	x	x
Date arrest is made (that leads to a conviction)	x	x
Date of Guilty Plea (in the court where sentencing occurs)	x	x
Date of Sentencing	x	x
***Discharge Date from drug court	x	
Successful	x	
Unsuccessful	x	
Discharge Date from traditional probation		x
Successful		x
Unsuccessful		x

Note * – The date used must be the same between the drug court and traditional probation groups. In-program offense is any of the dates listed above that occurs after a defendant starts drug court or traditional probation and before they are discharged.

Note ** – Start date is defined as when a defendant is supervised and receiving drug court or traditional probation services in the community (time-at-liberty).

Note *** – Discharge date, if successful, is when the defendant is released from the program and no longer under court supervision. Discharge date, if unsuccessful, is the date a defendant is lodged in jail and no longer receiving services, or the date absconded and no longer receiving services. The reason for discharge should be recorded as a nominal variable (e.g., 0=no; 1=yes). Additionally, if a drug court participants remains under probation supervision after discharge from drug court, this time it should also be tracked and this discharge date and reason also recorded.

Table 9

Post-program offenses for drug court and traditional probation defendants

<i>*Dates of measurement</i>	Drug Court	Traditional Probation
Discharge from drug court	x	
Discharge from traditional probation		x
<hr/> Date investigation is opened (leading to a conviction)	x	x
Date arrest is made (that leads to a conviction)	x	x
Date of Guilty Plea (in the court where sentencing occurs)	x	x
<hr/> Date of Sentencing	x	x

Note * – The date used must be the same between the drug court and traditional probation groups. Post-program offense is any of the dates listed above that occurs after a defendant is discharged from drug court or traditional probation.

Note *** – Discharge date, if successful, is when the defendant is released and no longer under court supervision. Discharge date, if unsuccessful, is the date a defendant is lodged in jail and no longer receiving services, or the date absconded and no longer receiving services.

Recommendation 1e: *Create standard definitions and controls for measuring recidivism that account for a person being incarcerated, on probation/parole, or unrestricted by the criminal justice system in pre- in- and post-program time windows.*

Table 10

Data checklist for pre- and post-program time controls

*Data checklist (pre/post program)	Drug Court	Traditional Probation
Time on probation/parole	x	x
Probation/Parole (in-state & court's jurisdiction)		
Probation/Parole (in-state & other court's jurisdiction)		
Probation/Parole (out-of-state)		
Probation/Parole (federal/tribal)		
Time in jail/prison	x	x
Jail (in-state & court's jurisdiction)		
Jail (in-state & other court's jurisdiction)		
Jail (out-of-state)		
Prison (in-state)		
Prison (out-of-state)		
Prison (federal/tribal)		

Note * – The date used must be the same between the drug court and traditional probation groups. In-program offense is any of the dates listed above that occurs after a defendant starts drug court or traditional probation and before they are discharged.

*For offenses that occur pre/post program a person may have been sentenced to jail or prison (meaning they may not have had an opportunity to reoffend during that time), and/or have been placed on probation (during which they were supervised and may or may not have been more likely to be caught reoffending).

Note** – Start date is defined as when a defendant is in supervised in the community (time-at-liberty).

Note*** – Discharge date, if successful, is when the defendant is released and no longer under court supervision. Discharge date, if unsuccessful, is the date a defendant is lodged in jail and no longer receiving services, or the date absconded and no longer receiving services.

Appendix C: Evaluation planning considerations

The following is a set of questions to guide planning data collection for a drug court evaluation measuring recidivism.

Project Administration

- What is the timeline for completing this project.?
- What is the projected cost for this project?
- Where is funding for this project coming from?

Data Collection

- What data is already collected, and what is needed for:
 - o Creating a matched-comparison group?
 - o Analysis of recidivism?
- What program level data is needed?
- Where will the data come from?
- What is your level of confidence in the quality and accuracy of the data used?

Data Sources

- What agencies possess the data needed for the evaluation and who do I need to contact for the data?
- Is there a cost to get the data?
- What protocols does the agency have for releasing the data?
 - o Does the agency require IRB review or research design before release of data?
 - o Is the data delivered with identifiers or de-identified?
 - o Does the agency releasing data demand to have a say in the research design or presentation of final results?
- Is the data released in an electronic file, or does it have to be entered by hand?
- How long will it take to get the data once a request is made?