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Jail-based competency treatment comes of age: Multi-site outcomes and challenges to the implementation of an evidence-based forensic continuum

Jerry L. Jennings | Kevin Rice | Christopher Baglio

Liberty Healthcare Corporation, Bala Cynwyd, Pennsylvania, USA

Correspondence
Jerry L. Jennings, Liberty Healthcare Corporation, 820 E. City Ave., Suite 820, Bala Cynwyd, PA 19004, USA
Email: jerry.jennings@libertyhealth.com

Abstract

The jail-based competency treatment (JBCT) model has become an established forensic practice across the country. From the perspective of implementation science and the three core elements of the Promoting Action on Research Implementation in Health Service (PARiHS) framework, the JBCT model is a remarkable example of how context (an unrelenting and overwhelmingly strong demand for forensic beds) has driven multiple state governments to facilitate implementation of a methodology in the absence of empirical evidence supporting its efficacy. This 7-year study of outcomes from four JBCT program sites provides this much-needed evidence by showing that JBCT restored 56% of 1553 male and 336 female patients over an average of 48.7 days. At the same time, the study highlights how variations in JBCT models, methods, and preadmission stabilization time present challenges to planned and effective implementation of evidence-based practice at the statewide system level. By identifying differential responsiveness to JBCT treatment by diagnosis and other factors,

The results of this study were previously presented by Rice and Jennings at the National Commission on Correctional Health Care, Correctional Mental Health Care Conference, Las Vegas, NV (21 July 2019).

the study suggests preliminary implementation ideas for what types of patients are well served by the JBCT model as part of a continuum of restoration options that includes inpatient, outpatient and diversion. Significant findings showed that JBCT patients were restored at a higher rate and in a shorter time if they were female, < 20 years old (highest restoration rate; those < 60 years old also significantly better rates), free of co-occurring intellectual and cognitive deficits, and malingering. Of the major diagnoses, schizoaffective disorder required a significantly longer length of JBCT treatment for restoration, and lower restoration rates than schizophrenia and bipolar disorder, although this was moderated by a significant interaction with abuse of amphetamines.

1 | INTRODUCTION

The jail-based competency treatment (JBCT) model has revolutionized the field of restoration of competency and is now widely accepted and used in multiple states. This recent and rapid development is remarkable from the perspective of implementation science because the JBCT model continues to expand despite its serious lack of evidence-based support. Using the three core elements of the Promoting Action on Research Implementation in Health Service (PARiHS) framework (Kitson, Harvey, & McCormack, 1998), the implementation of JBCT is an extraordinary demonstration of how context (an unrelenting and overwhelmingly strong demand for forensic "beds") has driven state governments to facilitate implementation of a methodology that lacked any strong empirical evidence.

In many ways, the implementation of JBCT is a real-world example of what *not* to do in terms of the ideals of implementation science. The research evidence should be strong before implementation is justified. It is not. There should be careful planning and "deliberate and purposive actions" to implement a new treatment (Proctor et al., 2011). Yet implementation of JBCT has been unsystematic and disorganized at best. The criteria for evaluating its effectiveness should be agreed upon before implementation. The only prior "agreement" regarding JBCT, however, has been a shared pursuit of a solution to the national "competency crisis."

This article will first describe the context which has spawned the JBCT model and driven its haphazard growth. After a summary of the limited empirical evidence to date, the article will present a large empirical study that provides some initial evidence to support JBCT. In presenting the methodology and results of the study, the article will elucidate the multiplicity of factors and real-world barriers that undermine the implementation ideals of sound research, careful planning and evaluation. It concludes with a discussion of how implementation science may better guide the future implementation of evidence-based research in JBCT practice.

1.1 | The context for the growth of JBCT

In 2019, Gowensmith (2019) coined the term "competency services crisis" to describe the unprecedented escalation in the demand for competency restoration and related forensic services in recent years in the United States. A recent report by the National Association of State Mental Health Program Directors (2017) showed a 25%

increase in the number of patients who were incompetent to stand trial (IST) receiving competency restoration services between 1999 and 2005, and a 37% increase between 2005 and 2014. This rising demand for competency restoration services, combined with a severe shortage of state forensic hospital beds, has created waiting lists and led many states and counties to try less intensive and/or alternative methods of competency restoration, such as outpatient restoration, restoration provided to ISTs in general population in jails, pretrial diversion services for mental health and substance abuse, use of the Sequential Intercept Model (Callahan & Pinals, 2020a) for diversions, and JBCT units.

As observed by Callahan and Pinals (2020b, p. 691), the nation's IST system "is in crisis" and the solution is "best facilitated by support for empirical research on the individual- and system-level factors that contribute to the waitlists and system paralysis." This study adds empirical support for the JBCT model but emphasizes that JBCT should be just one choice in a continuum of restoration service options. Ideally, a continuum approach enables the IST system to match the individual's restoration needs to the type and intensity of restoration services needed. A recent publication by Ash et al. (2020) presents a real-world example of a successful continuum in metropolitan Atlanta. Depending on their needs, IST patients in that program can be referred to six options: outpatient restoration at a local public psychiatric hospital; individual competency tutoring while housed in the general jail population; diversion out of corrections for mental health services; "specialized day treatment" in a designated 16-bed JBCT unit; a special program for women; and inpatient hospitalization.

Similarly, three recent publications have discussed JBCT as one option within an array of options. In the first, Wik (2018) surveyed and distinguished two types of JBCT: "full scale" JBCT programs typically dedicate a unit/pod/area within a jail for a day treatment-like program of individual and group-based therapeutic and competency-focused activities, while usually serving as a housing unit for IST patients; whereas "time-limited" JBCT services are typically limited to competency tutoring/supports provided to individuals while they are awaiting admission to the state hospital (called "stop-gap" services by Gowensmith, Murrie, and Packer, 2014).

In the second article, Heilbrun et al. (2019) reviewed and compared outcomes for restoration programs in multiple settings, including 10 state/forensic hospitals, three prison psychiatric units, eight community-based settings, eight jail-based settings, and three others. Acknowledging the potential of jail-based and community-based alternatives to traditional hospital-based restoration, the Heilbrun group proposed a "system-level decision tree" for determining the best restoration service option for IST patients.

In the third article, Danzer, Wheeler, Alexander, and Wasser (2019) conducted the first objective review and discussion of the differential benefits of delivering restoration of competency treatment in three main types of settings: traditional hospital, jail-based and outpatient (e.g., Gowensmith, Frost, Speelman, & Therson, 2016; Johnson & Candilis, 2015; Mikolajewski, Manguno-Mire, Coffman, Deland, & Thompson, 2017). The Danzer team systematically considered the advantages and disadvantages of each setting with regard to three primary outcome measures: (1) rates of restoration, (2) lengths of stay necessary to achieve restoration, and (3) lengths of stay necessary to determine non-restorability.

As shown in these articles, restoration services should be viewed as a continuum in which JBCT is designed to augment, not replace, traditional hospital-based forensic treatment. In the past decade, the JBCT model has proliferated, and JBCT programs are now active in multiple states. Most notably, "jail-based competency programs have become the rule statewide" in the State of Arizona, where five county-based JBCT programs provide nearly all restorations, while referrals to the state hospital for ISTs are few (Bloom & Kirkorsky, 2019, p. 1). Similarly, the California Department of State Hospitals (DSH) has embraced the model and developed a statewide system that offers a dozen county-based JBCT units with a total capacity of over 425 beds.

Historically, the haphazard proliferation of JBCT programs – arising independently in multiple jurisdictions and without any planned evaluative research designs – created an impossible situation for effective implementation science. It begins with the fundamental challenge of defining the JBCT model itself, which Wik (2018) broadly categorized as either "full scale" or "limited." To the best of our knowledge, there are full-scale JBCT programs in eight states, and limited JBCT programs in five more. Full-scale JBCT programs (coded as "F") are structured

programs that provide intensive daily treatment with both individual and multiple group-based rehabilitative activities, while limited programs (coded as "L") are constrained to one-to-one counseling in the jail on a less-than-daily frequency. In rough chronological order of implementation, these JBCT programs include Virginia (F: 1997–2002; L: since 2011), Louisiana (L since 2007); Arizona (four Fs: county programs starting in 2003 in Maricopa, 2007 in Pima, and 2010 in Yavacai and Yuma counties); California (12 Fs: starting in 2011 in San Bernardino County); Georgia (F: since 2011 in Fulton County); Colorado (F: since 2013); Washington (two Fs: since 2015); Minnesota (L: since 2015); Utah (L: since 2015); Wisconsin (L: since 2016); Texas (F: in development since 2017); Pennsylvania (F: authorized in 2018, not implemented) and Tennessee (L: years unknown). Florida has attempted mental health diversion programs for ISTs since 1999 (Florida Substance Abuse and Mental Health Corporation and Florida Partners in Crisis, 2009).

1.2 | Advantages and disadvantages to implementation

The growth of the JBCT model has been fueled by multiple perceived advantages, including accelerated access to more timely restoration and mental health services, reduction in prolonged incarceration for individuals waiting for limited hospital beds, reduction in the cost of restoration compared with hospitalization, removal of incentives for malingering, and improved proximity to local attorneys and family support (Ash et al., 2020; Danzer et al., 2019; Jennings & Bell, 2012; Kirkorsky, Gable, & Warburton, 2019; California Legislative Analyst's Office, 2012, 2017; Rice & Jennings, 2014; Wik, 2018).

Presumably, the greatest advantage of JBCT would be that it yields superior outcomes in terms of rates of restoration and length of time to restore compared with hospitalization and other outpatient restoration programs. In their "attempted meta-analysis" of 40 years of restoration studies in a wide array of treatment settings, Pirelli and Zapf (2020) found a base rate of 81% restoration and a median length of stay of 147 days overall and 175 days in studies that measured only a single group undergoing restoration treatment. Similarly, Zapf and Roesch (2011) reported that 75% of patients are restored in less than 182 days, while Gowensmith et al. (2016) reported a lower restoration rate of 70% for 13 outpatient programs and an average length of treatment of 149 days.

By contrast, as shown in Table 1, the available JBCT outcome data show similar rates of restoration, but in substantially shorter lengths of treatment. Of the nine JBCT studies that reported restoration rates, six programs achieved restoration rates of 79–90% within an average of 77–120 days. Most notably, the three JBCT studies that were specifically designed to restore patients within a targeted term of 60–70 days achieved much lower restoration rates of 55%–60%, but within a much better average of just 45–57 days. One study by Ash et al. (2020) reported a restoration rate of just 40%, but also achieved 31% more diversions and an average of 98 days to achieve restoration.

This broad comparison suggests that JBCT programs can achieve similar rates of restoration as traditional hospital-based treatment (and outpatient restoration) in significantly less time. But the rates of restoration are decidedly worse when JBCT programs are intentionally designed to be time-limited (e.g., target of 70 days). For example, the 83% rate of restoration of the Virginia JBCT program (Jennings & Bell, 2012), which had no time limits for restoration, was much higher than the 55–56% of the California JBCT studies, which did have a target of 70 days (Rice & Jennings, 2014; and present study). In short, JBCT offers a less expensive option – in terms of fewer days and lower per-diem costs – but there is a trade-off in successful restorability if the program is time-limited.

The JBCT model also has its disadvantages and critics. The most fundamental disadvantage is the austere, restrictive, and decidedly untherapeutic environment and culture of jails (Bloom & Kirkorsky, 2019; Douglas, 2019; Felthous & Bloom, 2018; Kapoor, 2011). A related concern is that jail-based programs may not have adequate mental health staffing and/or limited availability of therapeutic modalities and acute psychiatric support (Felthous & Bloom, 2018; Wik, 2018). Although large jails may have greater mental health resources than small ones, such as acute, semi-acute or designated mental health units, there is still the question of the appropriate allocation of staff resources to the patients in the JBCT.

TABLE 1 Summary of jail-based competency treatment (JBCT) programs with outcome data

State – program name Citation	Capacity/ average per month	*N*	Restoration rate	Average time to restore (days)	Years of data	Provider type
VA – "LFU"[a] Jennings and Bell (2012)	35	484	83%	77	1997–2003	State/private
AZ – Maricopa county Arizona State Hospital Report (2015)	–	–	64% reduced hospital	–	2003–2005	County/state
AZ – Pima county #1 Morenz and Busch (2011)	–	–	84%	82.5	2007–2011	County
AZ – "RTC" Yavatai Cty #1 Stewart (2015)	–	187	86.7%	120	2010–2014	County/state
AZ – Yavapai county #2 Bloom and Kirkorsky (2019)	20 14 average	306	79%	120	2010–2016	County/ private
[a]AZ – "RTC" Yuma county[a] Valerio and Becker (2016)	–	91	–	–	2010–2016	County
CA – "ROC"[a] Rice and Jennings (2014)	20	192	55%	57	2011–2013	State/county/ private
CA – "JBCT" Rice and Jennings (2019)	120	1889	56–60%	44.7	2011–2018	County/ private
GA – "JBRU"[a] Ash et al. (2020)	16	398	40% (31% diverted)	98	2011–2018	County/ university
CO – "RISE" Galin et al. (2016)	22 (52)	256	76% < 60 days 90% < 90 days	55 average 51 average to restore	2014–2016	State/private
AZ – Pima county #2 Bloom and Kirkorsky (2019)	26 average	Average 143/ year	83%	80	2016–2017	County/ private

[a]Peer-reviewed publication presenting detailed outcomes.

Other criticisms have focused on the ethical, legal and clinical problems of involuntary medication (IM) in correctional settings (Bloom & Kirkorsky, 2019; Danzer et al., 2019; Douglas, 2019; Felthous & Bloom, 2018; Kirkorsky et al., 2019). Moreover, if a JBCT program is prohibited from administering IM, the advantage of accelerated access to restoration services can disappear, because the attempt to restore with lower-intensity JBCT services can delay the initiation of hospital restoration, where forced medication is available (Ash et al., 2020).

Another criticism is that the JBCT model is explicitly focused on reducing symptoms and barriers to competency that can be addressed in a time-limited period. As such, the treatment received is not designed to address all the individual's psychiatric needs (Wik, 2018). Other critics point to the potential conflicts of interest that arise from the lack of separation between evaluators and treaters in determining when a patient is restored to competency (Callahan & Pinals, 2020b; Kapoor, 2011) and when treatment concerns must be balanced with the control, security and authority structure of the correctional system (Bonner & Vandecreek, 2006).

Finally, and specific to this article, critics point to the continuing lack of empirical support for the JBCT model (Danzer et al., 2019; Kirkorsky et al., 2019; Wik, 2018). Despite the proliferation of JBCT programs, the variability in its implementation across multiple states and counties has been a challenge to building a necessary evidence base, in two respects. First, the impetus to implement JBCT has been driven by state agencies which, in seeking practical solutions to the IST crisis, have foregone the step of designing formal evaluative research before implementation. Consequently, there are only a handful of peer-reviewed publications that provide details about JBCT program outcomes and some unpublished presentations and reports (see Table 1). Second, the extreme variation among JBCT programs is a barrier to comparing the effectiveness of different JBCT programs against traditional inpatient restoration. Even if the definition is restricted to "full scale" jail-based units that house IST patients together, there are differences in size/capacity, eligibility criteria/population served, the mix of staffing, capacity for IM, program components, separation of evaluators and treaters and other parameters.

The empirical outcomes from this multi-site, 7-year study of 1889 IST patients seeks to address this lack of evidence-based implementation by presenting large-scale aggregate outcomes for a particular JBCT model. This exploratory study has the advantage of allowing comparison of outcomes among four separate JBCT units that applied the same methodology. All four JBCT programs used separate housing units for ISTs in which competency services are delivered, applied the same staffing model, applied the same admission criteria and process, and used the same curriculum and components of restoration treatment (see Method section).

The origin of the JBCT model used in this study is traced to an innovative program that created a temporary 35-bed acute inpatient forensic unit in a regional jail in Virginia in 1997 (Jennings & Bell, 2012). Although the jail-based unit was intended only to augment capacity at the state hospital during the renovation of its secure forensic facility, the program proved that IST patients could be humanely stabilized, treated and restored to competency in a jail setting. In 5 years of operation, this jail-based unit achieved an 86% rate of restoration in an average of 77 days for about 484 IST patients.

Seven years later, in response to a call to address the shortage of state hospital beds and waiting lists in California, this model was replicated as a 20-bed pilot program in the San Bernardino County jail in 2011 (Rice & Jennings, 2014). The goals were to initiate psychiatric care and restorative treatment sooner, while reducing the prolonged time that IST individuals would otherwise wait in jail for transfer to the state hospital for restoration. The pilot also sought to maximize resources by distinguishing those IST patients who could be restored in a short-term program, while conserving state hospital beds for those who required longer-term intensive treatment.

This jail-based restoration of competency ("ROC") pilot program succeeded in meeting its objectives, earning a best practices award for its humane treatment from the California Council on Mentally Ill Offenders (COMIO) and saving an average of $70,000 per restoration compared with the state hospital (California Legislative Analyst's Office, 2012). Published outcomes for the first 30 months showed that 55% of patients were restored in an average of 57 days (Rice & Jennings, 2014). Given these promising results, the California DSH supported the continued expansion of the model as new JBCT programs opened in other county jails. Currently, there are about a dozen JBCT programs in California with a combined capacity of over 425 beds.

The current study was exploratory and had no a priori hypotheses to be tested because the data were collected and analyzed retrospectively from an existing database of variables and outcomes. The data analytic plan was to look at outcomes based on variables that are commonly studied in competency restoration research, such as gender, race/ethnicity, age, diagnostic category, medication compliance and presence of intellectual disabilities and substance abuse. The goal was to discern how JBCT results may be consistent or inconsistent with other studies regarding these variables. Furthermore, in terms of implementation science, it was hoped that empirical results might guide the implementation of evidence-based JBCT practice by suggesting categories of individuals that respond well (or poorly) to JBCT as compared with traditional hospital restoration. We also examined whether differences in how JBCT was implemented made any difference.

2 | METHOD

2.1 | Sample

Data were collected from monthly utilization reports to the California DSH, which provided demographic information (i.e., age, race and gender); dates of admission, restoration and transfer (used for calculating lengths of stay); medication compliance; and diagnostic information about the subjects. DSH gave its approval to analyze and present the data for research and quality improvement purposes. Data were aggregated and analyzed by two of the authors who are independent of the operation of the four JBCT program sites and could objectively evaluate the data. By combining the standardized spreadsheets from the four programs into a single spreadsheet, the researchers averted potential errors from manual entry or transfer of data. In the few instances in which the automated length of stay calculation was less than zero days or uncalculated, the researchers requested verification of dates from the JBCT program. For these reasons, the obtained data were believed accurate and reliable.

The sample consisted of 1553 males and 336 females who were adjudicated as IST and court-ordered for evaluation and treatment in one of four jail-based programs. The original "San Bernardino ROC" pilot program served 282 patients from San Bernardino County from 2011 to 2018, while the subsequent "San Bernardino JBCT" program served 1098 patients from 31 other California Counties from 2015 to 2018. The "Riverside ROC" served 417 patients from Riverside County from 2013 to 2018, while the "San Diego JBCT" served 92 patients from San Diego County in 2017. The ethnic/racial profile of the population served was 33.0% Hispanic, 32.4% Caucasian, 29.2% African-American, 3.6% Asian and 1.8% Other.

2.2 | Procedure/treatment

The IST patients were housed separately in traditional male or female residential pods within the respective county jails, with dayroom space and/or auxiliary space for group programming. The treatment teams for each JBCT unit were similar to a traditional forensic psychiatric hospital unit, including a forensic psychiatrist, forensic psychologist, psychiatric nurse, social worker, recreational therapist, licensed psychiatric technician and clerk to coordinate scheduling, court dates, transports and reports. The treatment teams were exclusive to the JBCTs and separate from other jail mental health personnel. The "direct care staff" were security officers who were specially trained in mental health and positive behavioral supports. A designated deputy participated in team meetings and was the only security officer privy to clinical information.

Treatment began with a multidisciplinary assessment of the person's psychological functioning, suicide and behavioral risk, current level of trial competency and likelihood of malingering. A battery of psychological tests was used to evaluate cognitive abilities, social and psychological functioning, psychiatric symptoms and potential malingering. As needed, the psychologist used other tests for specific targeted areas of deficit. Fourteen specific

competency deficits were assessed and identified using the Revised Competency to Stand Trial Assessment instrument (R-CAI) or the Competence-related Abilities Rating Scale (CARS; Hazelwood & Rice, 2011). Assessment continued through the course of the admission to measure response to competency treatment, monitor progress and identify new problems to target for restoration. Based on the assessments, the treatment plan was individualized consistent with the person's level of functioning and continued to be revised to reflect progress in treatment. It was common for the team to discuss the treatment plan informally on a daily basis and formally discuss treatment weekly.

The competency treatment curriculum was "standardized" by giving each patient the same 36-page workbook titled *Trial Competency Education*: *Patient Workbook and Study Guide*, and the 21-page workbook titled *Understanding My Legal Case*. Since the workbook chapters correspond to the 14 competency barriers assessed by the R-CAI or CARS, the team could flexibly focus on the competency barriers that were specific to the individual (rather than a generic one-size-fits-all approach to competency education).

The JBCT programs focused on individual strengths and targeted abilities that are related to competency, including remediation of deficits and alleviation of acute symptoms. The primary objective for most IST patients was to resolve the psychosis, when present, to enable the patient to regain general thinking abilities. This, in turn, would facilitate the patient's capacity to understand the legal/court process and co-operate with legal counsel in mounting a defense. If competency could not be restored, the team would compile evidence to credibly opine that the patient was not restorable. The treatment team combined the proactive use of psychiatric medications, motivation to participate in rehabilitative activities, and multimodal cognitive, social and physical activities that addressed competency in a holistic fashion.

Individuals in the program typically met one-on-one with a treatment professional at least twice daily about issues related to regaining their mental health and/or competency. They were also engaged in 3.5–5.5 hours of group-based psychosocial rehabilitative activities each weekday depending on the individual's current capacities (experience showed that the lower functioning patients could not tolerate more than 3–4 hours of focused work per day).

Although allowed by the California Penal Code, the JBCT programs did not deliver IM (except for the San Diego program which served less than 5% of the total subjects). Instead, the JBCT treatment teams encouraged voluntary assent to medication by building rapport, using persuasion and offering simple incentives, such as Ramon noodles, snacks, toiletries, and access to movies/TV shows.

Independent opinions of restoration of individuals were made by a psychologist who was not part of the team and did not have a therapeutic relationship with the individual.

2.3 | Measures

There were two dependent variables for measuring outcomes: *length of treatment to restore* (LOTR) is defined as the number of days from admission to the JBCT program to the date that the individual is opined to have been restored to competency (or not); and *rate of successful restoration* is the percentage calculated by dividing the number of individuals in a given category who were restored by the total number of persons in that category (both restored and not restored). Aggregation of these individual-level measures allowed for inferences of system-level implementation outcomes.[1]

2.4 | Primary independent variables

Analyses were conducted to determine significant differences in the two outcome measures based on the following independent variables: program site; gender; diagnostic categories; co-occurring substance abuse, intellectual/cognitive disorders and medication compliance.

3 | RESULTS

Outcomes by treatment site

Table 2 summarizes the results for each of the four program sites and for all sites combined. Results show that 56.2% of the patients served were restored to competency in an average length of treatment of 48.7 days. One-way analysis of variance (ANOVA) showed that the San Bernardino JBCT program, which served only out-of-county patients ("SB-OutCounty"), showed the shortest average LOTR, with a medium large effect size [$F(3, 1059) = 46.42$, $p < 0.001$, $\eta_p^2 = 0.116$]. The Tukey post hoc analysis showed significantly shorter LOTR for the out-of-county program than all three of the in-county program sites at a level of $p < 0.001$). χ^2 analysis also showed a significant difference in rate of restoration [$\chi^2(6, N = 1889) = 13.4$, $p < 0.037$, Cramer's $V = 0.060$]. The rates of restoration for the SB-OutCounty (58.4%) and San Diego In-County sites (60.9%) were significantly higher than those of the SB-InCounty (53%) and Riverside In-County sites (51.6%).

As the SB-OutCounty program was the only one serving out-of-county patients, analyses were conducted to determine if its shorter LOTR and higher restoration rates were attributable to administrative procedural differences. To be specific, individuals living within their local home county could be admitted directly to the three in-county sites; by contrast, the out-of-county patients serviced by the SB-OutCounty program had to wait for authorization by their local county courts and wait for available transportation to the treatment site. It is possible that the extended time needed to process and transport individuals to the one out-of-county treatment site would allow more time for patients to detoxify from substances, perhaps receive some initial psychiatric treatment from the mental health provider in the originating jail, or gain some degree of spontaneous stabilization and recovery from acute psychiatric symptoms. Three cohort groups served by the four JBCT programs were identified to test this hypothesis: (1) those served within their home counties (San Diego, San Bernardino, and Riverside); (2) those referred from Los Angeles County (which offered transports twice each week to SB-OutCounty); and (3) those from all other California counties (which were limited to a single transport each week to SB-OutCounty; Table 3).

TABLE 2 Overall outcomes by treatment site

	San Bernardino in-county "SB-InCounty"	Riverside ROC "Riv-InCounty"	San Bernardino out-of-county "SB-OutCounty"	San Diego JBCT "SD-InCounty"	All Combined
Total *N*	282	417	1098	92	1889
Average age (years)	37.1	36.9	38.1	38.1	37.7
Total *N* restored	151	215	641	56	1063
% restored	53.0%	51.6%	58.4%	60.9%	56.2%
Average LOTR days	62.9	61.6	40.4	55.8	48.7
Standard deviation	33.9	27.6	27.7	24.8	30.2
Range of LOTR	16–204	1–166	1–210	8–120	1210
% Females served	13.5%	18.9%	20.0%	0%	17.8%

Abbreviations: JBCT, jail-based competency treatment; LOTR, length of treatment to restore; ROC, restoration of competency pilot program.

TABLE 3 In-county versus out-of-county restorations

	N restored	Average LOTR	Standard deviation	Rate of restoration
In-county (SB, SD, Riverside)	513	58.4	30.1	54%
Los Angeles out-of-county	414	41.0	28.7	60%
All other out-of-county	135	35.4	23.6	54%
Total combined	1062	48.7	30.3	56%

Abbreviations: LOTR, length of treatment to restore; SB, San Bernadino; SD, San Diego.

An ANOVA found a significant difference with a medium-to-large effect size [$F(1, 2) = 58.28$, $p < 0.000$, $\eta_p^2 = 0.099$]. As hypothesized, those receiving competency treatment in-county ($M = 58.4$, SD = 30.1) had significantly longer LOTRs than both those arriving twice weekly from nearby Los Angeles ($M = 41.0$, SD = 28.7) and those from all other counties across the state ($M = 35.4$, SD = 23.6). A χ^2 test of independence was performed to examine the relation between administrative referral delays and restorability. The relation was approaching significance [$\chi^2(2, N = 1888) = 5.69$, $p < 0.058$, Cramer's $V = 0.055$]. Los Angeles County patients were successfully restored at a rate of 60% compared to 54% for those treated In County and 54% for those from all other counties.

Outcomes by gender and diagnoses

The proportions of patients who were restored to competency were 65.2% for females and 54.3% for males. A χ^2 test of independence showed that the difference in rate of restoration is significant for all diagnoses [$\chi^2(2, N = 1062) = 13.46$, $p < 0.001$, Cramer's $V = 0.084$]. Similarly, ANOVA showed that the average LOTR was significantly shorter for females ($M = 43.99$ days, SD = 26.77) than for males ($M = 49.91$, SD = 31.02) [$F(1, 1062) = 6.67$, $p < 0.010$, $\eta_p^2 = 0.006$]. Notably, females had a higher restoration rate and shorter average length of treatment for every diagnosis (with an *N* of at least 10), except for a lower rate of restoration for schizoaffective disorder and a longer LOTR for females with a primary diagnosis of amphetamine abuse.

Outcomes by broad diagnostic categories

To facilitate a more meaningful analysis of differences between diagnoses, all variations of schizophrenia were combined into one group, all variations of intellectual and cognitive disorders into another, and all types of primary substance abuse into another, while diagnoses with an $N < 10$ were excluded. This yielded 10 "broad diagnostic categories," as shown in Table 4. A one-way ANOVA was conducted to test whether there were significant differences in LOTR across the 10 broad diagnostic groupings. A significant difference was found with a nearly medium-effect size [$F(10, 1062) = 5.48$, $p < 0.000$, $\eta_p^2 = 0.050$]. Tukey post hoc analyses showed that the LOTR for schizoaffective disorder ($M = 63.2$) was significantly longer than those for schizophrenia ($M = 50.0$), bipolar disorder ($M = 47.0$), depression ($M = 39.8$), primary substance abuse-amphetamine ($M = 36.7$), primary substance abuse-other (36.1) and stress reaction ($M = 29.4$). Tukey post hoc analysis showed that the LOTR for schizophrenia was significantly longer than primary substance abuse-amphetamine. All Tukey post hoc differences were at the $p < 0.01$ level of significance or better.

TABLE 4 Restoration rates and length of treatment by broad diagnostic groupings [from shortest to longest length of treatment to restore (LOTR)]

Restored only	All combined				Males				Females			
	N	*M*	SD	% *R*	*N*	*M*	SD	% *R*	*N*	*M*	SD	% *R*
Stress reaction	13	29.4	20.8	86.7%	10	22.0	12.3	90.9%	3	54.0	27.2	75.0%
Primary substance abuse – other	28	36.1	29.7	82.4%	21	40.0	32.5	87.5%	7	24.3	15.4	70.0%
Primary substance abuse – amphetamine	78	36.7	22.8	92.9%	62	34.5	21.6	92.5%	16	44.9	25.9	94.1%
Depression	30	39.8	26.9	90.9%	25	41.0	26.6	92.6%	5	33.4	31.0	83.3%
Delusional	15	42.2	20.7	50.0%	11	42.8	21.0	44.0%	4	40.5	23.1	80.0%
Miscellaneous	14	43.2	20.2	51.9%	8	41.4	17.9	40.0%	6	45.7	24.4	85.7%
Bipolar disorder	204	47.0	28.7	68.7%	142	47.9	29.5	65.7%	62	45.1	27.1	76.5%
Schizophrenia	539	50.0	31.2	48.4%	442	51.8	31.9	46.6%	97	41.9	26.5	58.4%
Intellectual and developmental disabilities/cognitive/dementia	10	50.2	28.3	40.0%	10	50.2	28.3	41.7%	0			
Malingering	24	50.7	19.2	96.0%	24	50.7	19.2	96.0%	0			
Schizoaffective	108	63.2	33.1	52.5%	89	64.0	34.1	53.0%	19	59.3	28.0	48.7%
Total combined	1063	48.7	30.3	56.2%	844	49.9	31.0	54.3%	219	44.0	26.8	65.2%

Note: % R, % restored.

Outcomes by co-occurring substance abuse

In order of frequency of substance abuse, results showed the following: stimulant-amphetamine type (31.1%), cannabis (29.4%), alcohol (26%), stimulant-cocaine type (6.9%), unknown/unspecified (4.5%), opioid (3.8%) and all other types (< 2%). Overall, results found that 58.4% (1098/1880) of the patients had a primary or secondary diagnosis of substance abuse, with the highest percentage (32.8%) abusing amphetamine alone or in combination with alcohol and/or other substances (see Table). A χ^2 test of independence found that the relation between amphetamine abuse and restorability was significant [$\chi^2(2, N = 1829) = 37.65$, $p < 0.000$, Cramer's $V = 0.143$]. Those who abuse amphetamine alone or in combination with other substances ($N = 617$) had a 66% rate of restoration compared with 51% for all other subjects who abuse other substances or have no substance abuse diagnosis ($N = 1212$), but the average LOTR was nearly the same for both categories at 47.1 and 47.4 days. A χ^2 test of independence found that the relation between abuse of amphetamine and abuse of other substances and restorability was also significant [$\chi^2(2, N = 1098) = 5.96$, $p < 0.051$, Cramer's $V = 0.074$]. Patients who abused amphetamine alone or in combination with other substances ($N = 409$, $M = 47.1$, SD = 28.0) had a higher rate of restoration (66.3%) than those who abused alcohol and/or substances other than amphetamine in combination or alone ($N = 255$, $M = 47.4$, SD = 31.2), who were restored at a rate of 60.4%, or those for whom substance abuse was unknown or undetermined ($N = 32$) at a rate of 54.2%. An ANOVA found that those abusing amphetamine alone or in combination also had a significantly shorter LOTR than those abusing substances other than amphetamine [$F(2, 664) = 4.06$, $p < 0.044$].

In short, those abusing amphetamine appear to respond well to JBCT treatment. By contrast, those abusing alcohol did not – except when they were also abusing amphetamine. Those abusing alcohol alone or alcohol in combination with substances other than amphetamine showed the worst rates of restoration (at 56% and 56.9%, respectively), while those abusing alcohol with amphetamine or alcohol with amphetamine and other substances showed a higher rate of restoration (65.6% and 67.2%, respectively).

TABLE 5 Frequency of amphetamine abuse versus other substances

Substance abuse categories	*N*	% of total population with dx (1880)	*N* restored	% restored	Mean LOTR restored	SD
Amphetamine only*	182	9.7%	121	66.5%	47.8	27.7
Amphetamine and alcohol*	64	3.4%	42	65.6%	54.4	33.2
Amphetamine, alcohol and other substance abuse*	201	10.7%	135	67.2%	46.3	27.3
Amphetamine and other substance abuse (not alcohol)*	170	9.0%	111	65.3%	44.7	26.9
Total amphetamine abuse	617	32.8%	409	66.3%	47.1	28.0
Alcohol only**	100	5.3%	56	56.0%	54.3	38.9
Alcohol and other substance abuse (no amphetamine)**	146	7.8%	83	56.9%	44.4	31.2
All other SA (without amphetamine or alcohol), including uncertain	234	12.1%	183	78.2%	Uncalc	Uncalc
Subtotal of "no" from χ^2 analysis (including unknown/uncertain)	422	22.5%	255	60.4%	47.4	31.3
Unknown/uncertain substance abuse	59	3.1%	32	54.2%	Uncalc	Uncalc
Total with substance abuse	1098	58.4%	696	63.4%	Uncalc	Uncalc
Total cases with diagnosis	1880					

Note: Amphetamine use categories (marked *) had significantly higher rates of restoration and shorter LOTR than categories with no amphetamine use (marked **). Abbreviations: dx, diagnosis; LOTR, length of treatment to restore; SA, substance abuse; uncalc, uncalculated.

TABLE 6 Amphetamine abuse by three largest diagnostic groups (length of treatment to restore)

Diagnostic categories	Known substance abuse	Mean	SD	*N*	% abusing amphetamine
Schizophrenias	Abusing amphetamine	45.1	26.7	152	39%
	Not abusing amphetamine	50.3	32.4	235	
	Total	48.3	30.4	387	
Schizoaffective disorder	Abusing amphetamine	66.8	34.2	42	40%
	Not abusing amphetamine	61.1	33.0	63	
	Total	63.4	33.4	105	
Bipolar disorder	Abusing amphetamine	52.9	28.2	73	37%
	Not abusing amphetamine	43.9	28.8	125	
	Total	47.3	28.8	198	
Total	Abusing amphetamine	50.7	29.3	267	39%
	Not abusing amphetamine	50.0	31.9	423	
	Total	50.3	30.9	690	

Further analyses looked at the interactive effect of amphetamine abuse on the three largest diagnostic groupings: schizophrenia, schizoaffective and bipolar disorder (see Table 6). A 2 × 3 factorial ANOVA of the LOTR by the three diagnostic groups and co-occurring amphetamine abuse was conducted. A significant main effect for

diagnostic category was found [$F(2, 684) = 11.84$, $p < 0.000$, $\eta_p^2 = 0.033$] in which schizoaffective disorder had a significantly longer LOTR ($M = 63.4$, SD = 33.4) than both schizophrenia ($M = 48.3$, SD = 30.4) and bipolar disorder ($M = 47.3$, SD = 28.8). A significant interaction effect was also found between diagnostic category and co-occurring amphetamine abuse [$F(2, 684) = 3.78$, $p < 0.023$, $\eta_p^2 = 0.011$], in which those with schizoaffective disorder ($M = 66.8$, SD = 34.2) and bipolar disorder ($M = 52.9$, SD = 28.2) had longer LOTRs if they were also abusing amphetamine, while those with schizophrenia had shorter LOTRs if they were also abusing amphetamine ($M = 45.1$, SD = 26.7). It is also notable that the rates of co-occurring amphetamine abuse were virtually identical for the three diagnostic groups at 37%, 39%, 40% (or 34%, 36%, 34% if counting those with either unknown or no substance abuse).

Given the significant main effect showing that schizoaffective disorder had the poorest outcomes for LOTR compared with schizophrenia and bipolar disorder, a pattern analysis was conducted to see if there were differences in the pace of restoration over time for these three diagnostic groups. As shown in Figure 1, the total numbers of patients opined as restored and not restored for each of the three diagnostic groups were plotted across time within 5-day time cohorts. Taking the first graph as an example, it shows that 19 patients with schizophrenia were restored in the first 10 days of admission, while 14 were considered as not restorable. In the next 5-day period (days 11–15), 33 were restored and 12 were considered as not restorable, and in the next 5-day period (days 16–20), 56 were restored and 10 considered as not restorable. As shown in Figure 1, there were distinct patterns in the pace of responsivity to treatment. Trend lines were added to aid interpretation, which is explained in the Discussion section.

Outcomes by intellectual and cognitive disorders

Analysis showed that 7% of all patients had a diagnosis of an intellectual or cognitive disorder. A χ^2 test of independence showed a significant relationship between intellectual and cognitive deficits and restorability [$\chi^2(3, N = 1888) = 13.08$, $p < 0.004$, Cramer's $V = 0.083$]. Patients with intellectual disabilities had the lowest rate of restoration (38%) compared with those with cognitive disorders like dementia (45%), those with learning disorders such as attention-deficit hyperactivity disorder (53%), and those without any diagnosis of cognitive impairment (57%). An ANOVA of the LOTR showed a significant difference between the four groupings [$F(1, 3) = 2.64$, $p < 0.048$, $\eta_p^2 = 0.007$]. Those without cognitive impairments had the shortest LOTR ($M = 48.1$), followed in increasing length by those with neurocognitive disorders ($M = 52.8$), intellectual disabilities ($M = 61.8$) and learning disorders ($M = 63.9$). Tukey post hoc tests showed that the difference between intellectual disabilities and no cognitive deficits was closest to significance at $p < 0.089$.

Outcomes by age cohort

Analyses were conducted to determine any differences in outcomes based on the age of the individuals. Subjects were assigned to one of 17 age cohorts (of 3 years each) based on age at admission (e.g., ages 20–22.9). A χ^2 test of independence showed that the relation between age group and restorability was significant [$\chi^2(16, N = 1888) = 31.66$, $p < 0.011$, Cramer's $V = 0.129$]. Patients < 20 years old had the highest rate of restoration (74%), followed by patients aged 26–28, 29–31, and 44–47 (at 64%, 63%, and 60%, respectively). Seniors aged 62–65 and > 65 years had the lowest rate of restoration at 37% and 35%, respectively. An ANOVA showed no differences in LOTR by age group.

Given the high rate of amphetamine abuse and its impact on outcomes, another χ^2 test examined the relationship between age group and abuse of amphetamine, which was significant [$\chi^2(16, N = 1039) = 46.46$, $p < 0.000$, Cramer's $V = 0.211$]. The lowest rates of amphetamine abuse were observed for individuals aged < 20 years and

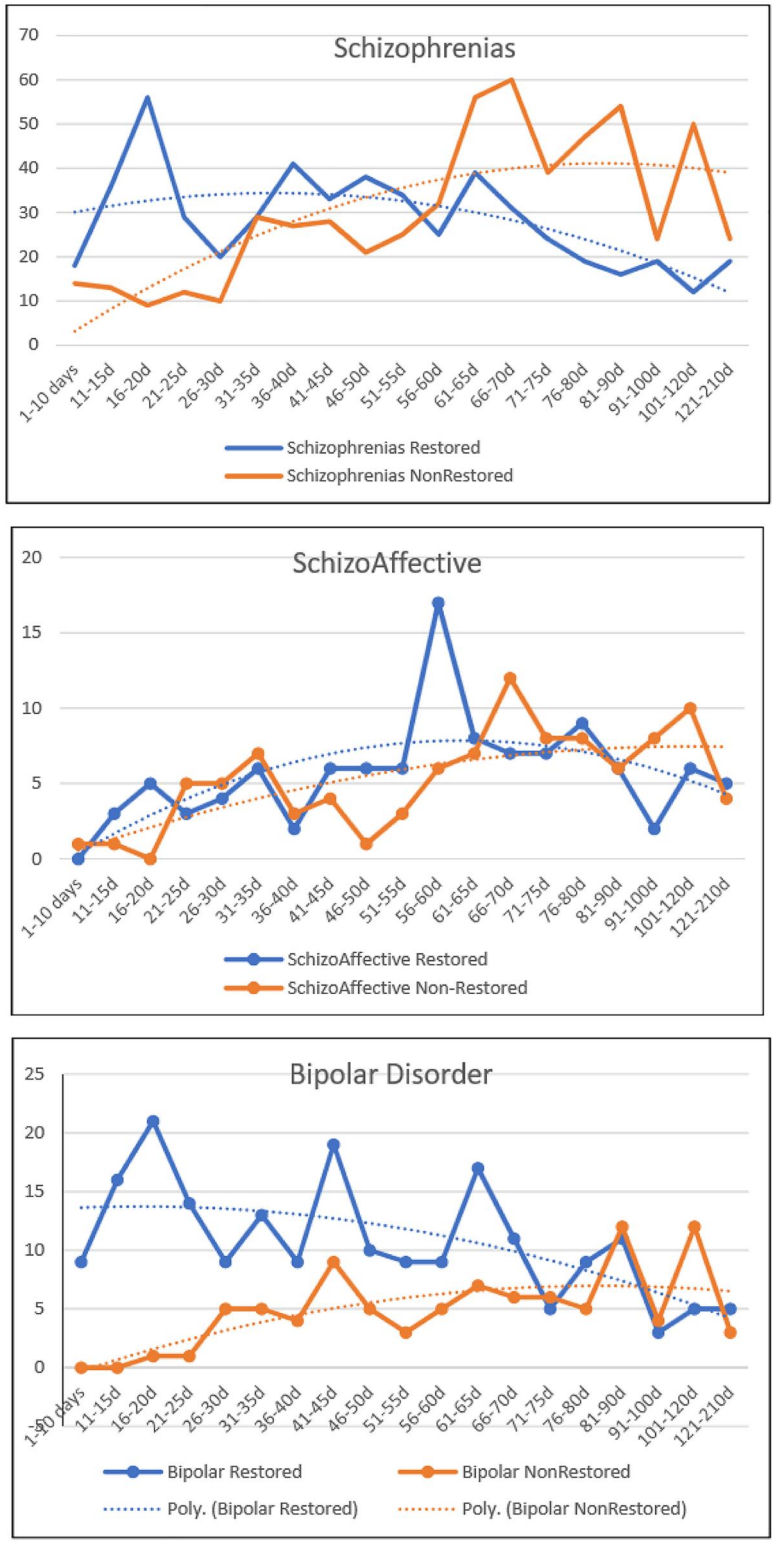

FIGURE 1 Differential response to treatment for three largest diagnostic groups (d, days) [Colour figure can be viewed at wileyonlinelibrary.com]

the five oldest age cohort groupings (53–56, 56–59, 59–62, 62–65, and >65 years). A one-way ANOVA showed no significant differences in LOTR in amphetamine abuse by age cohort.

Outcomes by medication compliance

Medication compliance data were available for 736 of the 1889 patients. Analyses were conducted to see the impact of medication compliance on rates of restoration and LOTR. The proportions of patients who were restored to competency were 69.5% for those not prescribed medications, 62.2% for those fully adherent to their medications, 47.9% for those with intermittent adherence, and 29.9% for those who refused recommended medications. A χ^2 test showed a significant difference in proportions [$\chi^2(3, N = 1277) = 73.3$, $p < 0.000$, Cramer's $V = 0.240$]. ANOVA of LOTR also showed a significant difference with a large effect size [$F(3, 735) = 4.61$, $p < 0.003$, $\eta_p^2 = 0.019$]. Tukey post hoc analyses indicated that those with no medications had significantly shorter LOTR than those who were fully adherent ($p < 0.005$) and those who were intermittently compliant ($p < 0.019$) and approached significance for refusing medications ($p < 0.056$). When the "no medication" group was removed from the ANOVA, no significant differences were found [$F(2, 646) = 0.72$, $p < 0.49$, $\eta_p^2 = 0.002$].

4 | DISCUSSION

The jail-based restoration of competency model has become established as a viable and humane model for the restoration of individuals who are adjudicated IST. But it has lacked the empirical evidence that should be prerequisite to its widespread implementation in multiple states. Based on the history of JBCT in California alone, one can see all eight types of "implementation outcomes" posited by Proctor et al. (2011) are present: adoption, acceptance, appropriateness, feasibility, cost-effectiveness, penetration, sustainability and fidelity. For better or worse, JBCT has been "adopted" and "accepted" in state forensic policy and practice as clinically "appropriate"; has been shown to be operationally "feasible" and "cost-effective"; and has thoroughly "penetrated" the field. The model has also proven to have "sustainability", defined by Proctor et al. (2011, p. 70) as "the extent to which a newly implemented treatment is maintained or institutionalized within a service setting's ongoing, stable operations" and by Rabin, Brownson, Haire-Joshu, Kreuter, and Weaver (2008) as the integration of a given program within an organization's culture through policies and practices. Indeed, the California DSH has established formal policies, standards and guidelines for establishing the required components of jail-based restoration programs and it supports continuing implementation of the model at many locations.

"Fidelity," the most often-measured implementation outcome, is the most problematic. It is defined as "the degree to which an intervention was implemented as it was prescribed in the original protocol" in terms of adherence, dose or amount of program delivered, and quality of program delivery (Proctor et al., 2011, p. 69–70). As the first JBCT model of its kind in California, the model evaluated in this study constitutes the "original protocol," and adherence to the Department's subsequent JBCT guidelines could potentially function as the measure of fidelity to that protocol going forward. As described in the Conclusion, the issue of fidelity is both the fundamental barrier to implementation of evidence-based JBCT and the future road to its more effective implementation.

This large multi-site study seeks to put "the horse in front of the cart" by providing the type of evidence-based support for the JBCT model that should be sought before its continued implementation in practice. The JBCT model is best applied as one option in a continuum that could include outpatient, pretrial diversion, "off-ramping,"[2] jail-based restoration units, and hospital-level treatment. In an era in which forensic hospital beds are limited and waiting lists can be long, this continuum approach can optimize the use of resources and better match appropriate treatment to individual level of need. Based on our empirical findings showing differential effectiveness of JBCT treatment for different diagnostic categories, it is possible to make some preliminary recommendations about

TABLE 7 Possible recommendations for jail-based competency treatment (JBCT) and hospital inpatient treatment by diagnosis

Diagnostic factors and characteristics	Recommended for JBCT	Recommended for hospital
Diagnosis of intellectual disability	No	Yes
Diagnosis of dementia and neurocognitive disorders	No	Yes
Young adults aged < 18–20 years	Yes	No
Seniors aged > 62 years	No	Yes
Primary diagnosis of amphetamine abuse (or amphetamine with alcohol)	Yes, if medically stable	No, except for alcohol or heroin dependency?
Primary or co-occurring diagnosis of alcohol or cocaine abuse	No	Yes
Primary or co-occurring diagnosis of amphetamine, cannabis or opioid.	Yes, if medically stable	No
Refusing medications	No, unless involuntary medication is available	Yes
Female	Yes	
Malingering	Yes	No
Delusional disorder	No	Yes
Stress reaction	Yes	Unnecessary
Depression and major depression	Yes	Unnecessary
Bipolar disorder	Yes, especially in short run and up to 70 days	Recommended if does not respond in 70 days
Schizophrenias	Yes, especially in short run and up to 50 days	Recommended if does not respond in 50 days
Schizoaffective disorder	Variable	Yes

screening and referring categories of IST patients to different levels of intensity, specifically, to either JBCT or hospital treatment (see summary Table 7). This step would facilitate more effective implementation of JBCT as an option.

Cognitive and intellectual disorders. The research literature is overwhelming in showing that individuals with intellectual and developmental disabilities (IDD) and neurocognitive disorders like dementia have poorer rates of restorability and longer lengths of treatment to restore competency. The results of this study are entirely consistent with this literature, suggesting that such individuals are poor candidates for a short-term restoration model like JBCT and are better served by direct referral to the state hospital or a forensic facility that specializes in IDD. However, it is also possible that these diagnostic groups may respond poorly to restoration efforts regardless of setting and intensity of services and that providing more intense hospital-level services is actually an ineffective use of resources.

Age. The results showed that young adults aged < 20 years had the highest rate of restoration (at 74%) in an average of 46.6 days. This high rate of restoration is consistent with three studies of juvenile restoration, which found a restoration rate of 71–76% in an average of 90–120 and 217 days (McGaha, Otto, McClaren, & Petrila, 2001; Warren et al., 2010, 2019). The notable difference is that this JBCT study achieved the same rate of restoration in a fraction of the time.

Three factors help to explain this outcome. For most of these young adults, this is their first episode of acute psychosis, which tends to respond well to psychiatric treatment. Second, this age group has very low rates of amphetamine abuse, which suggests that they have not abused this drug for a period long enough to suffer permanent changes in brain chemistry. Third, treatment teams observe that the youngest patients are understandably frightened by what may be their first arrest or incarceration, which motivates them to be cooperative and to actively engage in treatment.

At the opposite end of the age scale, those aged 62–65 and over 65 years had the lowest rate of restoration, at just 36%. This poor response to treatment may reflect the reduced energy and motivation of older people suffering from entrenched and intractable symptoms and behaviors established over a lifetime of chronic mental illness. It is fully consistent with the research literature that is decisive in finding that older individuals show poorer restoration outcomes (Danzer et al., 2019; Gay, Vitacco, & Ragatz, 2017; Morris & DeYoung, 2012; Morris & Parker, 2008; Mossman, 2007; Valerio & Becker, 2016; Warren, Chuahan, Kois, Dibble, & Knighton, 2013). The results suggest that seniors may be poor candidates for JBCT and better directed to hospital level care.

Medication refusal. The research literature shows that compliance with psychiatric medications is associated with better restoration outcomes (e.g., Galin, Wallerstein, & Miller, 2016; McMahon, Marioni, Lilly, & Lape, 2014; Warren et al., 2013). Not surprisingly, this study found that those refusing medications had a very low rate of restoration (only 30%), as compared with those with intermittent compliance (48%), full adherence (62%) and who were not prescribed medications (70%). Except for the San Diego site, the JBCT sites could not use IM, and refusal to take medications was one of the leading clinical reasons for inability to restore competency and the decision to transfer the patient to the state hospital. Of note, the San Diego JBCT had the highest rate of restoration at 61% and the shortest LOTR of the three in-county programs by nearly 1 week. Given that the San Diego data are limited to just 1 year of operation and only 92 patients, however, it is not possible to make a firm conclusion that IM is the primary reason for this higher restoration rate. Future research will be illuminating because the San Bernardino JBCT program has since added the capacity for IM and it will be possible to compare JBCT performance with and without the IM option.

Even if IM is available, however, the application of physical force to apply medications should be extremely rare. Use of persuasion, encouragement and incentives to comply with medications should always be the first and foremost choice. At the same time, the option of suggesting IM increases the team's flexibility in applying greater persuasion.

Primary diagnosis of amphetamine abuse. The results show that patients with a primary diagnosis of amphetamine abuse (or amphetamine abuse with alcohol abuse) tend to be restored very rapidly (in < 38 days) and at a high rate exceeding 90%. Presuming that recovery occurs more rapidly as the individual withdraws from the effects of active substances, these two categories appear well served in the controlled environment of the jail where they can have respite time from drug abuse to regain stability (the exception would be acute and severe dependency which requires careful medical attention and detoxification for withdrawal risks, but this treatment would probably have been completed prior to referral to the JBCT program).

The high rate of amphetamine abuse also deserves discussion. One third of the subjects had a diagnosis of stimulants-amphetamine type (not including cocaine) either alone or in combination with alcohol and/or other drugs. This was the highest rate of all substance abuse, followed by cannabis (29%), alcohol (22%) and stimulants-cocaine type (7%). This extraordinary high rate may be unique to this sample, which is predominantly drawn from southern California. Or it could be reflective of a national pattern that is not fully recognized. Presently the opioid abuse epidemic commands national attention, but an analysis of the rates of opioid abuse in this sample showed an average of only 4% with a high of 5% in 2016.

Other substance abuse. Individuals with primary or co-occurring diagnoses of amphetamine, cannabis, opioid, or polysubstance abuse (N = 273) were restored at rates of 63–80%, while those with primary or co-occurring diagnoses of alcohol or cocaine abuse were restored at 56%, suggesting that patients who abuse alcohol and cocaine may present with more chronic conditions that require more time for restoration and recovery. The

competency restoration literature on substance abuse appears minimal and no studies of amphetamine abuse were found. Two studies suggest that co-occurring substance abuse leads to longer stays and lower rates of restoration (Morris & DeYoung, 2012; Warren et al., 2013), while one study found that alcohol at the time of the offense was associated with more timely restoration (Nicholson, Barnard, Robbins, & Hankins, 1994).

Gender. Studies of restoration by gender have found that females are more likely to be restored (Morris & Parker, 2008; Rice & Jennings, 2014; Warren et al., 2013) or have shown mixed or inconclusive results (Fogel, Schiffman, Mumley, Tillbrook, & Grisso, 2013; Schwalbe & Medalia, 2007). This study found that women did significantly better in JBCT in both the rate of restoration and LOTR.

Our first guess for this strong result was a gender difference in the frequency of particular diagnoses that respond better or worse to JBCT treatment. In this study, however, women responded better than men in every diagnostic category except schizoaffective disorder (with a lower rate of restoration) and primary amphetamine abuse (with a longer LOTR). Since the gender difference in diagnostic frequency of schizoaffective disorder was < 1% and the disorder showed the poorest response to treatment for all patients, our data suggest that factors other than diagnosis explain why women achieved better outcomes than men.

The difference may be attributable to a difference in the quality of social support in the female treatment milieu compared with the males. Even though the treatment curriculum and mix of group-based and individual treatment were the same for both genders, it was observed that the women typically expressed much higher levels of interpersonal communication, altruistic help and emotional support for each other, which likely improved motivation and outcomes. This observed difference in gender milieu suggests the value of programming initiatives that can enhance the interpersonal community support in male JBCT units.

Less frequent diagnoses that responded well to JBCT. There were four primary mental illness diagnoses that occurred at least 15 times but less than 40 times. The first, *malingering*, showed a restoration rate of 96% and an average LOTR of 50.7 days. The JBCT model may be ideal for individuals suspected of malingering because it eliminates any advantage of seeking the perceived comforts of hospital-level care as a way out of the jail setting and it avoids the wasted use of an inpatient hospital bed. It is notable that all 25 cases of malingering were male.

Restoration rates were > 90% and LOTR was close to 40 days for both *major depression* and *depression*, while the restoration rate was 87% and LOTR was < 30 days for *stress reaction*. These results suggest that these three diagnostic groups may be well served in the JBCT setting and in a relatively short time-frame.

Lastly, given the profoundly fixed psychotic delusions characteristic of *delusional disorder*, it would be expected that short-term treatment in the JBCT would be unlikely to have a lasting impact. Indeed, results showed a 50% rate of restoration, but also a relatively short average LOTR at 42 days. It appears that JBCT may be effective with delusional disorder to the degree that clinical staff can restore overall competency despite (or "independent" of) the patient's major fixed delusion and, if not, can recommend transfer to the hospital.

Most frequent major diagnoses. Differences in response to JBCT were found for the three most common diagnoses: schizophrenia and bipolar and schizoaffective disorders. First, based on the pattern analyses conducted, it appears that *bipolar disorder* may be well served in the short-term jail-based setting. Bipolar disorder showed extremely high rates of restoration in the first 25 days, followed by a steady decline in effectiveness from days 26 to 70, and then a sharp decline in effectiveness thereafter (see Figure 1). The high effectiveness of initial treatment of bipolar disorder is probably due to the prompt restoration of lithium to patients who had stopped medication, which often yields a rapid recovery. On the other hand, if the patient with bipolar disorder has not responded in the first 70 days, it appears that further time in the JBCT is decreasingly likely to achieve restoration. In addition, there is a significant interaction effect that shows that those with bipolar disorder and co-occurring amphetamine abuse respond poorly to treatment in the JBCT setting. There could be something about amphetamine that is more appealing to patients with bipolar disorder and/or interferes with the usual effectiveness of standard medications for bipolar disorder.

Second, like bipolar disorder, patients with *schizophrenia* diagnoses showed extremely high rates of restoration in the first 25 days, followed by moderate effectiveness from days 26 to 50, and then followed by a very sharp

decline in restorability thereafter (see Figure 1). The high effectiveness of initial treatment is probably due to the prompt restoration of anti-psychotic medications to patients who have stopped medication, which often yields a rapid recovery. Alternatively, this pattern may be related to the positive short-term impacts of detoxification from amphetamine abuse as suggested by the interaction effect showing that those with schizophrenia who also abuse amphetamine have a significantly shorter length of treatment than those who do not.

Third, results show that JBCT was less effective in restoring patients with *schizoaffective disorder* and they required the longest treatment time to be restored. Given its complex and variable mix of thought disorder and affective disruption, schizoaffective disorder may be the most difficult to accurately diagnose and generally needs more time to respond to treatment. Like bipolar disorder with co-occurring amphetamine abuse, patients with schizoaffective disorder who abuse amphetamine do significantly worse than those who do not. Perhaps it is the shared affective disturbance of bipolar and schizoaffective disorders that makes amphetamine more attractive to these patients and/or that causes greater interference with recovery. Overall, it appears that JBCT treatment for schizoaffective disorder is quite poor in the short run, but slightly more effective after 55 days (with a spike of success at 56–60 days). Ultimately, however, the rate of restoration for schizoaffective disorder falls lower as the length of stay goes longer.

4.1 | Implications for implementation of evidence-based practice

The differential patterns of response across the three main diagnostic groups raise important questions about facilitating implementation of evidence-based JBCT practice. The overall average length of time to restore was 48.7 days, which is a third of the median of 147 days across restoration programs, broadly defined (Pirelli & Zapf, 2020). Clearly, more than half of the sample (56%) was restored in a relatively short time. The challenge is distinguishing which diagnoses and factors promote restoration using JBCT. For example, the pattern analysis showed that many of those with bipolar disorder and schizophrenia responded quickly to JBCT restoration efforts in the first 25 days, while the remainder responded at a slower rate over the next 25 days, and only a few responded well beyond that time. In short, many "fast-responding" participants responded well to the JBCT, even many with the most severe psychotic disorders. At the same time, many participants (44%) did not respond to JBCT at all and needed transfer to the state hospital for additional restoration services.

Perhaps most noteworthy is this study's finding of significantly better outcomes for the out-of-county group. It was theorized that the added time waiting for admission to the JBCT allowed more time to detoxify from substances, possibly to receive some initial psychiatric medications in the originating jail, and/or to gain some degree of spontaneous recovery from acute symptoms. Given the primary goals behind implementation of JBCT nationally – reducing both demand for traditional state hospital IST restoration beds and the excessive length of time that mentally ill individuals spend in jail awaiting those beds – it would be paradoxical, to say the least, to recommend a return to increased waiting time as a way of diverting ("off-ramping") unnecessary hospital admissions. Nonetheless, future implementation research needs to measure the time from arrest to admission to JBCT as a key moderating factor in improving implementation.

The issue of "fast responders" also emerged as an unexpected interaction effect with amphetamine use. Patients with schizophrenia responded more quickly to JBCT if they were abusing amphetamine, while those with bipolar disorder and schizoaffective disorder responded more poorly when abusing amphetamine. It is possible that some of the fast-responding group included people diagnosed with a functional psychotic disorder, but who were actually experiencing amphetamine-induced psychosis. It is also possible that the removal of amphetamine in the jail setting has a more rapid "alleviating" effect on the psychotic symptoms of schizophrenia. Given this new knowledge of high rates of amphetamine abuse in the sample, future implementation research will need to carefully differentiate persons with functional psychotic disorders abusing amphetamine from those experiencing amphetamine-induced psychosis.

4.2 | Limitations and future research

In conclusion, this research contributes to the need for empirical support of the JBCT model itself, but also has major implications for the implementation of a continuum of restoration options at the system level. In particular, the results suggest which diagnoses may be well or poorly suited to JBCT's less intensive, short-term focus. But the study also has its limitations and raises new and complex challenges for the implementation of evidence-based forensic practices.

Design. The design was an uncontrolled, descriptive study of the JBCT program, which is weaker than other potential implementation study designs, for example a cluster-randomized or quasi-experimental design. Furthermore, the study was exploratory in nature and analyzed data retrospectively from an existing database, so it lacked any clearly defined hypotheses for testing. The lack of hypotheses increases the risk of chance findings.

Conflict of interest. As shown in Table 1, JBCT programs have been variously operated by state agencies, counties, universities and private for-profit companies, and most often in partnerships of these entities. Critics of the model suggest that private companies may have a financial conflict of interest in delivering the service (Douglas, 2019). Ostensibly, private providers would be more biased than states, counties, or universities in their desire to show that JBCT is effective at restoration (to justify its continued use and make a profit). In this case, however, the state controlled all referrals to JBCT and there was no incentive either to "rush" patients to restoration or to keep them longer than necessary. By drawing the anonymous data from spreadsheets and having the analysis performed by two "independent" psychologists with no direct involvement in operating any of the four program sites, there was no bias or expectations about the results obtained. Other than the natural desire of any provider to show overall good outcomes, the two independent authors had no vested interest in any of the four programs, no preconceived hypotheses to confirm, and no financial benefit to gain from conducting the research. The author who was directly responsible for the JBCT programs had no role in the data analysis but contributed to efforts to understand and clarify the results obtained.

Fidelity of the model. Measuring fidelity requires an evaluation of adherence to an "original protocol." As noted in the historical overview, however, there is no single protocol for jail-based restoration of competency programs. Even if JBCT is restricted to "full scale" jail-based units that house IST patients together, programs differ in terms of size/capacity, eligibility criteria, staffing, use of IM, program components, separation of evaluators and treaters, and other parameters. Given the absence of an empirical evidence base for a specifically defined JBCT prior to its implementation, this study – by attempting to control much of the above variation through the application of the same specified set of JBCT methods and protocols at four different "full scale" program sites – could be said to set out the "original protocol."

The most important implementation lesson about JBCT gained from this study is the need to control for system-level variation regarding the time preceding admission to JBCT treatment. The authors incorrectly presumed the sites were equivalent (except for one small site that could use IM and did not treat females) and were frankly surprised to find that the one program site serving out-of-county patients had significantly better restoration rates and shorter LOTR. Further examination revealed that an administrative procedural difference delayed the time that out-of-county patients are admitted to the JBCT to begin restoration. This "pre-treatment time" spent in jail before admission to the JBCT unit appears to be a critical time period during which individuals may detoxify from substances and, depending on the originating jail, receive some psychiatric medications and treatment to begin stabilizing their conditions, or even time for "spontaneous recovery" to begin. In order to make fair comparisons of jail- and hospital-based restoration, future research will need to strictly define and control for the influence of these pretreatment "administrative" differences (i.e., by tracking the three dates of arrest, court-ordered referral, and admission), which may be the area of greatest difference among JBCT models across the country.

In conclusion, this study reflects the tremendous complexity of factors at play in conducting research in real-world forensic settings for both treatment outcomes and implementation outcomes. In their categorization of

outcomes for implementation research, Proctor et al. (2011, p. 65) observed that some implementation studies "infer implementation success by measuring clinical outcomes at the client or patient level" (as in this JBCT study), "while other studies measure the actual targets of the implementation," such as quantifiable success in relieving system-wide census pressures (which has been the context driving the expanded use of the JBCT model in California). This research study needed to focus on treatment outcomes first because of the unmet need to establish an evidence base for this "new" intervention. This step is needed to justify the growing use of JBCT and, as cautioned by Felthous (2020), to ensure that diligent discussion and planning precede any premature and ill-advised application of JBCT to the restoration of insanity acquittees.

It has been argued that the greatest challenge to the implementation of evidence-based JBCT practice is the tremendous variation in design across programs and interventions. At the same time, there is a great deal of variation across hospital-based programs nationally on many of the same variables that critics express concern about in JBCT. One could argue that the whole field of competency restoration treatment lacks clear evidence-based interventions. To quote from the "attempted meta-analysis" by Pirelli and Zapf (2020, p. 134), "virtually no published data reflect specific intervention efforts that lead to competence restoration". They also observed that "competency restoration procedures were overwhelmingly nonspecific across studies and not reported in more than half of them". It is hoped that this study contributes to the quest for effective implementation of an evidence-based continuum of restoration options that includes JBCT.

ENDNOTES

[1] One reviewer queried the value of additional "implementation outcome" measures such as cost-effectiveness and "ability to relieve system-wide census pressures." The former was twice measured by an independent California government agency, in 2012 and 2017, showing huge savings over traditional state hospital restoration (California Legislative Analyst's Office, 2012, 2017).The latter measure is more complex. Although implementation of JBCT has expanded dramatically as one systemic solution, the overall demand for IST services in California (i.e., the PARiHS context driving implementation) has itself increased dramatically, and so census pressure appears unrelieved. In fact, the benefits of facilitating better access to restoration services – by using JBCT – may be (positively) contributing to the rising demand for IST services.

[2] Off-ramping is the practice of assessing IST individuals in the jail setting, who have been waiting for admission to restoration services, to determine if they still need restoration services or can be discharged or diverted as appropriate.

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