

# Validation of the Booth Evaluation of Absconding Tool for Assessment of Absconding Risk

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Although absconding from secure forensic settings is uncommon, it can have serious consequences for the patient, the hospital, and the public. To assess risk of absconding in this population, using empirically based literature and clinical expertise, the authors designed a 28-item structured professional judgment measure, the Booth Evaluation of Absconding Tool (BEAT). To evaluate the psychometric properties of the BEAT, we completed a blinded, case-matched, retrospective study of absconders ( $n=57$ ) and non-absconders ( $n=26$ ) between 2009 and 2017. Together, the absconders accounted for 120 absconding incidents over the study period. The incidents had similar characteristics as previously published descriptive studies of absconding behavior. The BEAT demonstrated solid internal consistency ( $\alpha = 0.78$ ), promising inter-rater reliability across many items, and good accuracy in differentiating absconders from controls (area under the curve = 0.77). Considering the limitations associated with a retrospective chart review study, these results show promising reliability and validity for the BEAT and suggest that the BEAT could be a useful tool in assessing and managing absconding in forensic patients.

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The terms absconding, eloping, away without official leave, unlawfully at large, and escaping are used to describe when patients in a secure facility leave the institution without the privilege or authority to do so.<sup>1,2</sup> Absconding from secure forensic hospitals is a relatively understudied aspect of forensic mental health<sup>3</sup> and is complicated by a low base rate, with repeat absconders accounting for many incidents,

and a lack of consistent definition of absconding. Some define absconding by length of time away from the facility, ranging from those who “broke privileges” for several minutes to those who were away on extended leaves beyond 72 hours. Definitions can also be based on absconding location, i.e., off unit, off grounds, into the community, or out of the jurisdiction.

Despite the attention media might pay to these incidents, the rates of absconding are low from most secure environments. Rates vary in the research from about 3 percent of forensic patients<sup>4,5</sup> to as high as 20 percent.<sup>2,6–9</sup> Absconding can also account for a large proportion of critical events in addition to violence, substance use, and other rule violations.<sup>10</sup>

While the prevalence of absconding is lower in forensic psychiatric settings than in other psychiatric populations,<sup>8</sup> the impact of a single episode can bring many negative consequences, which might include harm to the patient, such as suicide,<sup>11,12</sup> self-harm, self-neglect, medication nonadherence, violence,<sup>13</sup>

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physical harm, and death.<sup>14,15</sup> Some patients might be exploited financially or sexually by others, given their mental health problems.<sup>16</sup>

Among the most serious consequences when a patient absconds is violence to others. Many individuals in secure environments are placed there because of their risk to others. Absconders might do serious violence, commit further criminal offenses, or consume alcohol and substances. Thankfully, most of the literature suggests that when absconding occurs, violence is rare. Wilkie *et al.*<sup>6</sup> reported that violence was perpetrated by only 1 percent of their absconders, with 2 percent being victims of violence. Absconders usually remained in the local area, with 58 percent returning on their own and 28 percent with police. The most common outcome was substance use at about 32 percent. Bowers *et al.*<sup>17</sup> confirmed that while nursing staff call police in about 47 percent of absconsions, most incidents result in no violence to others, and most patients return on their own.

Despite the rarity of physical harm or violence with absconding events, the administrative fallout from such events can be substantial. The media will often seize on an absconding event, particularly if the individual is notorious or perpetrates serious violence during the event.<sup>18</sup> The media's attention to high-profile absconding cases can undermine the public's confidence in the forensic system's ability to maintain public safety. Heavily publicized events link criminality to mental illness, which can increase stigma toward patients.<sup>2,19</sup> This puts societal pressures on forensic and mental health systems, with a potential to move away from evidence-based rehabilitation principles to approaches focused on risk and liability avoidance. Practically, this can mean restrictive legislation<sup>20</sup> or other pressure to restrict all patients regardless of risk. Furthermore, systems could lose the confidence of both the public and those in their service.

There is also the impact on the care team when an incident occurs.<sup>21</sup> Nursing staff may experience increased anxiety and reduced confidence in their ability to practice.<sup>21,22</sup> Team members might feel blamed, or unsupported, or worry they might suffer punishment for the event. There are examples of absconding being facilitated by other patients or even by staff,<sup>23,24</sup> which could have even more devastating effects. These team concerns could then affect patient care, resulting in inappropriate

punishment or risk-management interventions following the absconding event. There might be a desire to halt rehabilitation efforts for the patient indefinitely. Even if the team is still advocating for the patient, some therapeutic activities for all patients may be suspended hospital-wide to enhance security.

Given these important concerns, which can be seen in many areas of forensic practice juxtaposed against the liberty interests of detainees, there have been calls for structured risk assessment and management in forensic settings,<sup>25-27</sup> which logically should be extended to absconding.<sup>7,28</sup> For absconding, it is still common to use unstructured clinical judgment,<sup>22</sup> if the topic is discussed by the treatment team at all.<sup>29</sup>

Although most clinicians will be able to bring clinical risk assessment skills to the assessment of absconding risk, unfortunately there are limited tools available to assist in structured risk assessment of absconding, and no tools have strong evidence as valid instruments. In 2002, Wolber and Karanian<sup>30</sup> were among the first authors to propose a literature-informed assessment approach. They outlined 16 factors to consider, encouraging a formal review of each tied to a relevant management strategy. While comprehensive, the tool has not been evaluated in the literature for effectiveness or applicability in other facilities. It also does not consider the modern impact of social media and administrative concerns of current practice. Finally, structured clinical judgment approaches were not engrained into clinical practice at the time of its development, limiting the measure.

Hearn and colleagues<sup>31</sup> developed a tool called the Leave/Abscond Risk Assessment (LARA), which was based on clinical expertise and a review of the literature. It has 29 items grouped into three domains, with a tiered risk response encouraging consideration of unplanned or emergency privileges. The authors suggest a multidisciplinary assessment of risk that includes violence risk and discussing an away without official leave scenario, which considers what might happen if the individual does abscond. They encourage using an "absconding pack," consisting of a photo and patient information, to assist police. Finally, they recommend using the LARA to make an informed judgment about intervention levels to ensure safe leaves. While more refined than the instrument developed by Wolber and Karanian,<sup>30</sup> the LARA has not been validated

in the literature. It has been criticized for not providing enough structure to identify a level of risk, and for not including a space to provide examples and details on the items.<sup>32</sup> It also does not consider some important factors, such as administrative and legal fallout from absconding incidents. The authors nevertheless provided a valuable summary of the current literature, taking some initial steps in the development of a useful structured professional judgment (SPJ) tool.

In 2015, Cullen and colleagues<sup>2</sup> looked prospectively at a sample of 135 patients, of whom 27 were responsible for 56 absconding incidents. From this, the authors identified a brief risk assessment scale that included four weighted factors for absconding: history of sexual offending, previous absconding, inpatient substance use, and inpatient verbal aggression. Whereas the negative predictive value was high at 0.91 (95% CI 0.82–0.96), the positive predictive value was low at 0.34 (95% CI 0.21–0.49), suggesting users can be confident that those who score low will not abscond, but those who score high should have a more thorough assessment completed before restrictions or interventions are imposed. The authors acknowledge that the tool development was limited by the study design, the small number of subjects, and missing data. Further, it is unclear why sexual offending would stand out as a specific risk factor, and the authors do not seem to consider any acute risk factors as they evaluated for absconding over a two-year period. As identified by Cullen *et al.*, some expected risk factors like level of violence and psychopathy might have influenced clinical decision-making outside of the tool. Further, this tool does not have an SPJ focus and thus lacks guidance for management or interventions to reduce the risk of absconding. While a short and simple tool would be helpful in some patient populations, a comprehensive risk assessment tool would greatly assist in guiding patient assessment and management based upon key risk variables.

Finally, Simpson and colleagues<sup>7</sup> also evaluated management of absconding risk. Rather than implementing a specific risk assessment tool, the authors focused on administrative procedures to manage risk. Specifically, they instituted a formal privilege policy, which includes a structured violence risk assessment with the Historical, Clinical, and Risk Management (HCR-20) tool<sup>33</sup> and clinical discussion with a multi-disciplinary team, which is then reviewed

independently at the administrative level. Although there is likely a great deal of institution- or jurisdiction-specific practice, the results suggest that it would be important to have a clear policy and procedure to granting privileges. On the downside, the study was not looking at any specific absconding risk tool. Further, the intervention of focusing on absconding with the resulting increased team awareness might have been the reason for the reduction rather than the new process specifically. Kasmi and Brennan<sup>32</sup> have developed a similar form and procedure.

Authors have also examined whether tools developed for other types of risk assessment had some role in specifically predicting absconding. O'Shea and Dickens<sup>34</sup> examined the utility of the Short Term Assessment of Risk and Treatability (START).<sup>35</sup> There was a low rate of absconding, likely limiting the results. With this limit, there was some support to screen out low-risk individuals, finding an area under the curve of 0.659 (95% CI 0.531–0.786) for the specific risk estimate, a negative predictive value of 0.984, and a positive predictive value of 0.059. Wilkie *et al.*<sup>6</sup> similarly reported some predictive value for the HCR-20 total score. Simpson and colleagues<sup>7</sup> noted that the absconding group in their study had a higher total HCR-20 score compared with their control group. Martin and colleagues<sup>36</sup> replicated these results in their 2018 study. The Psychopathy Checklist-Revised (PCL-R)<sup>37</sup> was reported to be a possible predictor in one study,<sup>38</sup> but has been found in recent research to not be predictive.<sup>2</sup> Unfortunately, none of these nonspecific instruments systematically evaluate the numerous empirically supported factors for absconding. Further, in the face of an adverse outcome, it might be difficult to argue that absconding risk was sufficiently reviewed and managed.

Given clinical and administrative needs to have a high-fidelity and legally defensible approach to granting privileges and assessing absconding risk, and confronted by the limitations in previous studies, we developed an SPJ tool, the Booth Evaluation of Absconding Tool (BEAT). Although the BEAT provides a structured approach to professional judgment and is relatively easy to administer, it has not been validated, and the psychometric properties are not known.

In this study, we sought to validate the BEAT. We hypothesized that the BEAT would differentiate between those who do and do not abscond.

**Table 1** Domains and Constituent Items of BEAT

Historical	Past elopement; Deceitfulness; Past substance use; Past impulsiveness
Clinical	Follows rules; Psychosis influencing risk; Apathy/hopelessness; Substance use urges; Medication nonadherence; Plan to leave; Recent destabilization
Psychosocial	Hospital stressors; External stressors; Legal stressors
Administrative	High-violent index; External contacts; Acute risk to others; Substance use; Extended leave; Media attention; Suicide/harm to patient; Exploitation of patient; Antisociality/criminality
Protective	Hospital ties; Insight for consequences; Physical impairment; Psychological impairment; Other protective
Clinical Judgement/Case Formulation	Overall risk; Individual factors/likely scenario; Scoring bias and confidence; Risk management plan

BEAT = Booth Evaluation of Absconding Tool

Moreover, we hypothesized that the BEAT would also identify when an absconder might abscond. The aim of this study is to help clinicians consider the risk of absconding from a facility and interventions to mitigate risk. With improved understanding of risk posed, absconding can be reduced, along with the associated negative consequences.

## Methods

### Development of the BEAT

In developing the BEAT, items were derived from evidence-based factors in the literature. Specifically, we reviewed the English-language literature on absconding for potential risk factors and absconder characteristics. This review yielded a large number of potential factors. Guided by the approach used by Hearn and colleagues,<sup>31</sup> items that recurred in the literature, came from quality studies, or had good face validity were generally included, assuming they could be operationalized and were relevant to current forensic practice. Many were also consolidated into a unifying concept (e.g., hospital stressors, which might include staff, other patients, or the setting). Much of this information had been summarized previously, highlighting antecedent actions, behavior during leave, and possible relevant factors.<sup>8,14,17,39,40</sup> We added more items based on clinical experience and the literature, including administrative concerns. Further, as an SPJ tool, the formulation allows any factor the team feels important to be considered, such as patients being less likely to abscond in difficult winter conditions. Items were then mapped onto the well-known HCR-20 risk assessment structure.<sup>33</sup> After review with colleagues and a limited roll-out, the draft tool was finalized.

As seen in Table 1, the BEAT consists of 28 items divided into five sections plus a final judgment section. Sections include four historical items, seven recent

clinical items, three recent psychosocial items, and nine potential administrative concerns if the person did elope. Five protective items that might impede “success” in absconding are also considered. Finally, raters make a clinical judgment of the patient’s overall likelihood of absconding. Although not included in the current study, the final steps would be to discuss the likely absconding scenario and finally to consider risk-management strategies such as decreased privileges, increased check-ins, limiting access to funds, and other techniques.

Scoring criteria were outlined by raters in a draft manual. In clinical practice, each item would be considered for its presence and relevance. For the study we scored each item as 0 (not present), 1 (partial or maybe present), or 2 (definitely present), for a total possible score range of 0 to 46. Protective items were negatively coded as 0, -1, or -2, serving to lower the overall score if present (by a maximum of -10 if all present). The BEAT consists of 28 items, along with a subjective rating of overall absconding likelihood (0 = low likelihood, 1 = low-moderate, 2 = moderate, 3 = moderate-high, and 4 = high likelihood), likelihood of unbiased scoring, and confidence in scoring (both scored similar to BEAT items).

### Setting

The study was conducted at the forensic psychiatric programs in Ottawa and Brockville, Canada, which are part of the Royal Ottawa Health Care Group. Combined, the programs have approximately 110 inpatient beds located in an urban center and in a more rural setting. All beds are located on secure units; however, we only considered the 68 beds on units where patients have privileges to access the hospital grounds or community, providing reasonable opportunity for absconding. Most patients in these two facilities have been found not criminally responsible on account of mental disorder, with a minority being unfit to stand trial. These terms are the



respective Canadian equivalents of not guilty by reason of insanity and incompetent to stand trial in the United States.

### Study Design

The study was approved by the Research Ethics Board of the Royal Ottawa Mental Health Centre. The design was a double-blinded, retrospective, case-matched study. Specifically, three trained raters were blinded to outcome (i.e., abscond incident or not) to avoid scoring absconders as higher risk. In addition, the three raters were assigned cases with which they were unfamiliar, so as not to bias scoring based on personal knowledge of the patient's history. Each rater scored approximately 80 cases, including about 10 percent repeated by all raters for inter-rater reliability. All incidents of absconding from 2009 to 2017 noted in the electronic incident management system were included.

In the first phase of the study, we sought to clarify the characteristics of the absconding population, including demographic and leave characteristics. A total of 150 incidents by 64 patients were identified in the database. Of this group, 30 incidents from seven patients were eliminated because of lack of available file information or they were not deemed not criminally responsible on account of mental disorder or unfit to stand trial, leaving 120 incidents by 57 patients for analysis.

In the second phase of the study, we obtained a list of all patients in the forensic program, including age, diagnosis, and unit. Initially, all 57 absconding patients (Abs) were matched by age (within five years), gender, and unit (equating to security level) to true control non-absconding patients (true controls). On final analysis, some true controls could not be used as they were not deemed not criminally responsible on account of mental disorder or unfit to stand trial, they had a history of absconding after reviewing the file, or the files were unavailable. We decided to proceed with the true control sample available for the analyses.

Three raters (one forensic psychiatrist and two psychology graduate students) ensured standardization of BEAT scoring through several mock cases while editing the draft scoring manual. Once inter-rater reliability was acceptable (Total score: inter-class correlation [ICC] = 0.667; final risk judgment: ICC = 0.706) on mock cases, raters completed blind scoring of the files prepared by coders who were

unaware if the scoring was before an absconding episode. Files contained information leading up to scoring time point, such as court reports, tribunal reports, nursing notes, and case conference notes. Because of the nature of the individual clinical file, the quality and quantity of information was variable for different cases.

Ultimately the blinded BEAT scoring could be of a non-absconder (true control) at a random time point or of an absconder prior to an absconder incident (Abs-I) to see if the BEAT differentiated these groups. For the absconders, in addition to scoring before an Abs-I, we also selected random self-control time points to score the BEAT where they did not abscond (i.e., absconder-control [Abs-C]). Having absconders scored before an incident (Abs-I) and before a random "self-control" time point (Abs-C) allowed the absconders to act as their own controls to see if the BEAT could discern when an absconding episode might occur, and not just whether it could differentiate absconders from non-absconders.

### Sample Description

The study sample was derived from the electronic incident management system and archival medical records. The sample included 83 individuals (57 absconders, 26 true controls). Of the absconders, 44 (77.2%) were male with an average age of 33.7 years at their first absconding incident. Of the true controls, 23 (88.5%) were male and 31.8 years of age on average at their first control case. See Table 2 for additional information on patient type, diagnosis, and offending history. As with most forensic populations, comorbidity was common. Psychotic disorder plus comorbid substance use disorders occurred in 56.2 percent of absconders and 57.7 percent of controls. Psychotic disorders plus antisocial traits or personality occurred in 8.8 percent of absconders and 15.4 percent of controls. We scored a total of 228 BEATs. The distribution of absconders (Abs-I and Abs-C) and non-absconder true controls is shown in Table 3.

### Statistical Analysis

In addition to the descriptive statistics of controls and absconders and of the Abs-I data, we applied several other statistical approaches to examine the preliminary validity of the BEAT,

**Table 2** Demographics of Offender Type, Offense History, Offense Type, and Psychiatric Diagnosis

	Absconders	Controls
Age (at earliest incident), y	33.72 ± 10.6	31.81 ± 6.2
Male	44 (77.2)	23 (88.5)
Offender type		
NCRMD	50 (87.7)	23 (88.5)
Unfit	4 (8.8)	2 (7.7)
Under assessment	0 (0.0)	1 (3.8)
Other/missing	3 (3.5)	0 (0.0)
Offense history	6.7 ± 8.4	4.1 ± 8.7
Most serious offense		
Major assault	22 (38.6)	8 (30.8)
Minor assault	8 (14.0)	7 (26.9)
Threats	5 (8.8)	1 (3.8)
Reckless driving	3 (5.3)	0 (0.0)
Arson	2 (3.5)	2 (7.7)
Theft	2 (3.5)	2 (7.7)
Failure to comply	2 (3.5)	2 (7.7)
Homicide	2 (3.5)	1 (3.8)
Weapon	2 (3.5)	1 (3.8)
Robbery	2 (3.5)	0 (0.0)
Sex offense (physical contact)	0 (0.0)	1 (3.8)
Other	5 (8.8)	1 (3.8)
Diagnosis		
Psychotic disorders	38 (70.3)	23 (88.5)
Mood disorders	12 (22.2)	2 (7.7)
Substance use disorders	39 (72.2)	19 (73.1)
Antisocial traits or disorder	6 (11.1)	5 (19.2)

Data are presented as *n* (%) or mean ± SD. Absconders: *n* = 57; Controls: *n* = 26.

NCRMD = not criminally responsible on account of mental disorder

**Table 3** Breakdown of Number of Absconders, True Controls, and BEATs Coded<sup>a</sup>

	Patients	BEATs
Total	83	228
True control	26	52
Absconder	57	120
Absconder control	57	56 <sup>b</sup>

<sup>a</sup> Number of absconders = Absconder incidents + Absconder controls.

<sup>b</sup> One absconder control was missing a BEAT.

BEAT = Booth Evaluation of Absconding Tool

such as inter-rater reliability on all items, with 8.3 percent of cases using ICC, internal consistency estimates with Cronbach's alpha, binary logistic regression, and receiver operating characteristic (ROC) curve analysis on the BEAT total score. ROC curves have been cited as an effective approach for assessing the sensitivity and specificity of a predictor on classifying a dichotomous outcome of interest while having the advantage of robust assumptions. ROC methods do not require the assumption of a normal underlying

**Table 4** Characteristics of Unauthorized Leave Incidents

Age at time of incident, y	33.3 ± 10.1
Absconded from	
Indirectly supervised (grounds)	62 (51.7)
Indirectly supervised (community)	18 (15.0)
Unit	16 (13.3)
Community pass accompanied or with approved person	12 (10.0)
Supervised grounds	7 (5.8)
Overnight pass	1 (0.8)
Location during leave	
Within city limits	62 (51.7)
Outside city limits but in Ontario	22 (18.3)
Home of family or a friend	12 (10.0)
Own home	6 (5.0)
Outside of Ontario	4 (3.3)
Within hospital	4 (3.3)
Shelter	3 (2.5)
Other hospital	2 (1.7)
Use substances (yes)	52 (43.3)
Alcohol	34 (65.4)
Marijuana	21 (40.4)
Cocaine	6 (11.5)
Amphetamines	5 (9.6)
Offend while abscond?	6 (5.0)
Violent offense	1 (0.8)
Victim of violence	1 (0.8)
Attempt or ideation of suicide	1 (0.8)
Return to hospital	
Self	51 (42.5)
Law enforcement	45 (37.5)
Hospital staff	14 (11.7)
Other	6 (5.0)
Time away	
< 30 min	8 (6.7)
0.5–2 h	22 (18.3)
2–6 h	25 (20.8)
6–24 h	30 (25.0)
24–72 h	12 (10.0)
72 h to 1 week	7 (5.8)
> 1 week	11 (9.2)

Data are presented as *n* (%) or mean ± SD. *N* = 120. Study period: April 2009 to December 2016.

distribution and remain constant despite having low base rates of the outcome.<sup>27</sup>

## Results

### Phase I

Descriptive statistics for the sample's absconding events can be found in Table 4. Half of absconding events occurred while the patient was indirectly supervised on hospital grounds, followed by 15 percent of events while indirectly supervised in the community. Of note, 13 percent occurred from the inpatient unit. Patients stayed in the local region in half of the cases, whereas 18 percent stayed within

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**Table 5** Distribution of Absconding Incidents Among Absconders

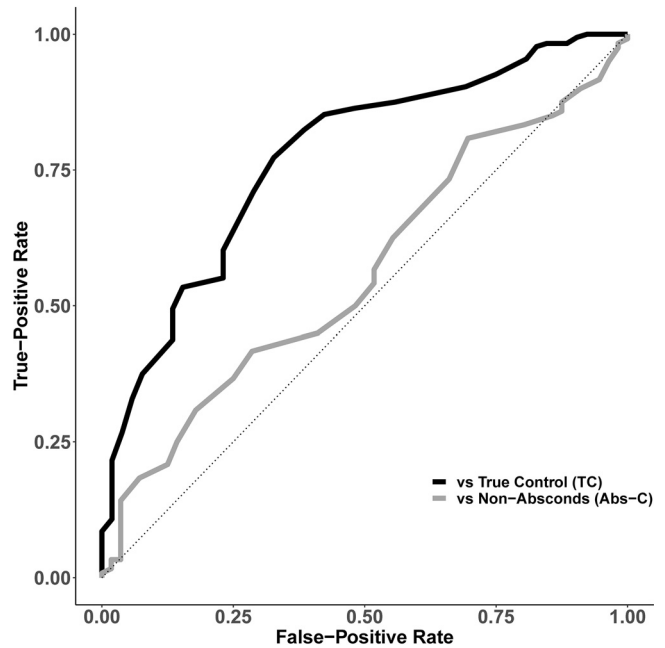
Incidents per Absconder	Frequency
1	30
2	17
3	3
4	4
5+	3

the province but left the community limits. Only 3 percent of events resulted in the patient leaving the province. Exactly 70 percent of events ended in patients returned within 24 hours of leaving, returning either by themselves (42.5%) or with law enforcement (37.5%). It was not clear from our study design why a large portion of the patients returned on their own. While on unauthorized leave, substance use was common (43.3%), mostly alcohol use. Re-offending was rare in this sample, with only one incident of violence reported (5.0%). Being a victim of violence and attempting suicide was also rare (0.8%). As seen in Table 5, 30 absconders had single incidents, 17 had two incidents, and the remaining 10 had multiple absconding incidents.

### Phase 2

Descriptive statistics were calculated for the BEAT itself. Across the entire sample ( $N = 228$  for all incidents scored), patients' scores ranged from 0 to 35 (of a total possible score of 48), with a mean  $\pm$  SD score of  $16.5 \pm 7.2$ . Reliability was generally good, with a Cronbach's alpha average of 0.78 for BEAT assessments by the three blind raters, yielding fair internal consistency. Most of the BEAT scores involved a single rater, and we calculated ICCs for the scoring procedure using a two-way mixed-effects model for absolute agreement. BEAT items achieving good reliability were past substance use (ICC = 0.85, 95% CI 0.72–0.94), hallucinations/delusions (ICC = 0.81, 95% CI 0.64–0.92), substance use urges (ICC = 0.77, 95% CI 0.58–0.90), risk of substance use if eloped (ICC = 0.79, 95% CI 0.62–0.91), and risk of media attention/high profile (ICC = 0.80, 95% CI 0.64–0.91). Of the remaining items, 7 of 29 achieved moderate reliability<sup>41</sup> (including BEAT total score and the subjective rating of overall likelihood of absconding).

For our main analysis, we wished to evaluate the BEAT's predictive utility, namely whether BEAT



**Figure 1.** Area under the curve for Booth Evaluation of Absconding Tool (BEAT) total score differentiating absconders and controls.

Note: versus true controls (TC) indicates BEAT performance in differentiating absconders BEAT scores (Abs-I + Abs-C,  $n = 176$ ) from those of true controls (i.e., patients who have never absconded,  $n = 52$ ); versus non-absconds (Abs-C) indicates BEAT performance within absconding patients (Abs) in differentiating Absconding Incidents (Abs-I,  $n = 120$ ) from random non-absconding time points (Abs-C,  $n = 56$ ). Dotted line indicates the reference line, where predictive utility is absent or roughly chance.

scores could significantly differentiate absconders (Abs-I) and non-absconders (true controls). Therefore, we conducted a one-way analysis of variance comparing BEAT total scores across three groups; absconders before an absconding incident (Abs-I) scored highest with a mean  $\pm$  SD score of  $18.5 \pm 6.9$ , absconders before a control time (Abs-C) scored slightly lower at  $17.3 \pm 6.1$ , and true controls, who had no absconding incidents, scored lowest at  $11.2 \pm 6.2$ . Results showed significant difference between groups,  $F(2,225) = 22.7, p < .001$ . Hochberg's GT2 *post hoc* analyses identified significant differences between non-absconders (true controls) and absconders (Abs-I) ( $p < .001$ ) but did not identify differences within the absconders' absconding (Abs-I) and their self-control time points (Abs-C) ( $p = .567$ ).

In addition, we ran an ROC analysis using the BEAT total score to determine whether a higher total BEAT score could differentiate between the absconders (Abs-I) and non-absconders (true controls). Using the pROC package, 95 percent

**Table 6** Specific Items Showing Significant Predictive Ability

Item	Odds Ratio	<i>p</i>
Historical subscale	2.00	<.001
Past elopement	7.77	<.001
Deceitfulness	4.71	<.001
Past impulsiveness	3.71	<.001
Clinical subscale	1.27	<.001
Follows rules	1.72	<.05
Substance use urges	1.81	<.01
Medication nonadherence	1.78	<.05
Psychosocial subscale	1.20	Not significant
Decreased tolerance	1.66	<.05
Administrative subscale	1.26	<.001
External contacts	2.99	<.05
Acute risk to others	1.71	<.05
Extended leave	3.06	<.001
Criminality/antisociality	2.04	<.01
Protective subscale	1.23	Not significant
Hospital ties	1.91	<.05
BEAT total score	1.18	<.001
Overall risk estimate	2.28	<.01

BEAT = Booth Evaluation of Absconding Tool

confidence intervals (CI) were calculated using a stratified bootstrapped sample of 2,000 replications. As Fig. 1 illustrates, the total score provided a reasonable area under the curve value of 0.77 (standard error = 0.04, 95% CI 0.70–0.84). This measurement can also be interpreted as the probability (0.77) that a randomly selected absconder will have a higher score on the BEAT than a randomly selected control (non-absconder). Within absconders, we then tested whether the BEAT total score was able to classify an absconding time point (Abs-I) from a control time point (Abs-C). The total score could not adequately differentiate these subgroups (area under the curve = 0.56, standard error = 0.05, 95% CI 0.47–0.65).

A series of binary logistic regressions were conducted on the BEAT items and scale totals to determine whether an elevated score increased the odds of being an absconder versus a control = 0. As shown in Table 6, several subscales and items had significant individual predictivity. Only items that reached the significance ( $p < .05$ ) threshold are included in the table. All subscale totals are included regardless of significance.

Finally, we used *post hoc* analyses to determine positive and negative predictive values. For this purpose, we calculated cutoff scores based upon the sample's mean BEAT score range (10–23) to represent a medium score, with scores  $\pm 1$  SD above or below the mean to indicate low (0–9) and high (24+) scores, respectively. As the BEAT is first and

foremost an SPJ instrument, we would not encourage using total scores to equate to risk; rather, we recognize that a single item could be significant, requiring risk management. Using the high score range as a cutoff for significant risk (24+), the BEAT's positive predictive value was 0.77 and its negative predictive value was 0.52. The positive predictive value is 77 percent, with 23 percent of subjects rated "high risk" (scored 24+) who did not end up absconding. We suspect this is an underestimate given limitations of the blinded retrospective study design. Further, likely there are some items such as previous absconding that would have better predictive value than others, such as likelihood of acute violence. All items were considered relevant in clinical decision-making.

## Discussion

The goals of this study were to describe our absconding patient population and to determine the psychometric properties of the BEAT, a new absconder risk assessment tool. Although not designed to estimate the prevalence or rate of absconding, our study is consistent with past findings in suggesting that absconding is a relatively rare event. For two forensic sites that are usually at full occupancy, with most patients having grounds and community privileges numerous times per day, making theoretically tens of thousands of absconding opportunities per year, only 57 patients completed 120 absconding episodes over 8 years. As highlighted by Scott and Meehan<sup>42</sup> who had only 17 absconding incidents in an estimated 46,000 leaves, the vast majority of patients utilize privileges in a successful manner. Our study indicates that the likelihood of absconding at any point in time is extremely low, so stakeholders and media should be educated about the rarity of these events and should acknowledge that forensic systems are adept at managing the security of patients.

The results of this study add to the limited knowledge base regarding typical absconding incidents and characteristics of patients that abscond. The characteristics of the absconding events reflect results found by other forensic mental health programs in Ontario. For example, Martin and colleagues<sup>36</sup> reported that 55.6 percent of those who absconded did so while on a grounds pass, and 43.1 percent of those included in the 2014 study by Wilkie *et al.*<sup>6</sup> also absconded on an unaccompanied hospital pass. In our study, 51.7



percent of incidents in the present study occurred while patients were on hospital grounds.

Our study supports the message that absconding incidents are usually rare, short-lived, and without violence. Consistent with the rehabilitation goal of the forensic system, graduated community reintegration will bring rare and often unforeseeable adverse outcomes, including extended leave, harm to others, or harm to the patient. It is unavoidable that these events will bring scrutiny to the patient, the hospital team, and the forensic system. Absconding routinely results in patients being restricted to the unit for variable lengths, and it is often discussed at annual tribunal reviews of privileges, resulting in ongoing restriction of liberty. Though very infrequent, when a high-profile patient escapes or an adverse event does occur, the media will publicly scrutinize the parties involved. This scrutiny may result in changes to hospital policy or legislation that places an unsupported restriction on many forensic patients.<sup>43</sup>

The forensic system routinely navigates the competing interests of autonomy and freedom of the person against the state's power to limit such rights under the principle of *parens patriae* or police power. Thus, individuals are held involuntarily due to the risk they might pose to themselves or others. Our patients pose a risk primarily due to the underlying mental health problems that led to the index offense.

In balancing freedom rights against the potential risk patients might pose to others, there are often crucial nexus points where the individual's mental health needs require a graduated reintegration into society. With this gradual reintegration model, there should be an ongoing evaluation of the treatment and rehabilitation needs of the individual, the potential risk to society, the resources available, the liberty rights of the person, the powers of the state, and the rights of society. This consideration inevitably will mean moving from a very secure environment to a less secure environment, which must be done carefully and thoughtfully, using accepted risk-management principles.

Regardless of the rarity of absconding events and adverse outcomes related to absconding, clinicians and administrators must have a robust and legally defensible system to grant privileges as part of rehabilitation while, at the same time, justifying the restriction of patient's liberty rights. While some assessment approaches are available, none have been validated.

Given the gap in evidence-based absconding risk tools, we have assessed the utility and psychometric

properties of the BEAT. Despite notable limitations inherent in retrospective blinded chart review, with minimal training on the instrument we had fair overall interrater reliability. Items with higher variability between raters were often linked to limited information in the file or to more subjective items. We suspect this would improve if performed on familiar patients after raters gained some experience with the instrument.

Most promising was that, despite the design limitations, the BEAT had an impressive ability to differentiate absconders from non-absconders, with absconders scoring significantly higher on the total BEAT score compared with lower-scoring controls. This ability was confirmed with an area under the curve of 0.77, suggesting fair predictive power. While we hoped that the BEAT would be able to predict within absconders when they would abscond, the current study did not support this. We suspect that the limited file information may have been a barrier and that future study designs might show evidence for the tool to predict fluctuating risk of absconding patients.

It is important to note that the BEAT was not developed as an actuarial tool to make black-and-white predictions of high or low risk. Instead, as an SPJ tool, the goal is to provide clinicians with a standardized and legally defensible approach to assessing and managing the risk of absconding. A total score should not dictate the overall risk nor the risk-management interventions. Instead, each item should be evaluated on relevance for that patient. Some items may be present but not particularly relevant. Some individuals may have few items but may require intense management interventions. Similarly, there may be institution-specific or patient-specific factors to consider that are not specifically outlined in the tool. The case-formulation approach would allow analysis and management planning on a case-by-case basis.

Although the BEAT is lengthy given the number of items, the research team found that the items were fairly easy to score and scoring could take as little as a few minutes once we reviewed the patient's file or when we did a repeat scoring on a patient for a second time-point. We suspect that rating by the primary clinician informed by the team or rating by the team could be done fairly easily and quickly.

We envision using the BEAT as part of a comprehensive risk and management plan for a patient in

the forensic system. As Simpson *et al.*<sup>7</sup> described, formal risk assessment could form part of the overall approval process in a forensic center. The BEAT would serve this purpose well, providing useful information about absconding risk. Violence risk would be done separately. This information could then be used by those determining a patient's privilege level. Once approved, the psychiatrist and nursing and other team members would monitor the appropriateness of the approved privileges. In our center, we have case conferences approximately every six weeks for inpatients in which the risk of harm and current rehabilitation and risk management are evaluated. Based on this, the team requests privileges from hospital administration. Annually, the hospital recommends certain privileges to a tribunal. The BEAT would assist the tribunal and hospital administrators as they consider absconding risk factors. The ultimate goal is to provide the least restrictive approach to rehabilitate patients while protecting the public. In the unfortunate event of an adverse outcome, it would be desirable to have evidence of a comprehensive and high-fidelity process for the assessment of risk.

Comparing the BEAT to other available tools, the LARA tool<sup>31</sup> and the assessment developed by Wolber and Karanian<sup>30</sup> have not been validated, although both allow for a comprehensive evaluation of absconding risk married to a risk-management plan. The four-item model developed by Cullen *et al.*<sup>2</sup> has some evidence of utility but misses many items from the literature and does not allow for an SPJ-type individualized risk assessment and individualized management strategies. Nonspecific tools similarly have mixed results thus far and do not allow a thorough analysis of risks specific to absconding.

The assessment of absconsion risk should be assessed periodically throughout a patient's hospitalization, most importantly assessing risk when re-evaluating the patient's level of community access and privileges.<sup>1</sup> The BEAT is a user-friendly tool that can be implemented easily in routine treatment conferences for patients, or it can be used to assess risks prior to other critical decisions in forensic practice, such as for admission or for movement to a less secure unit.

### **Limitations and Future Directions**

The current study has a few limitations. The primary limitation is that the BEAT was designed to be administered by a clinician conferring with a

treatment care team, rather than by several blinded raters using limited file information. Using retrospective chart review methods with a tool designed for dynamic, in-depth prospective risk assessment decreases the validity of scoring. The file excerpts for the blinded ratings had varying degrees of detail, including files with as little as a few lines of partially legible handwritten clinical notes or entries that did not provide all of the clinically relevant information required to score all items effectively. It is likely that this method falsely decreased the apparent short-term predictive power of the BEAT, as highlighted in some of the weaker ICC values. Certain items such as external stress or insight of consequences likely would have been more accurately captured through treatment team discussions or direct questioning of the patient.

Related to this limitation was the requirement to have the raters blinded to the outcome (absconded or not). In addition, raters were given patients with whom they had no familiarity. Although this maintained unbiased scoring of the BEAT, it likely decreased the accuracy of scoring on some BEAT items. Again, it is likely that this falsely decreased the tool's predictive ability.

As an initial study, we recognize that it is unclear whether our results are representative of other institutions and treatment settings and thus whether our results are generalizable. We limited our study to patients who were posttrial and had access off the unit. We note that, although motivation for absconding literature was included in the development of the BEAT,<sup>8,36,39,40,44</sup> this study did not examine this aspect. Further understanding of these motivations could assist in evaluating absconding risk.

When using cutoffs as loose guidelines for patient management, the tool achieved intermediate values for positive and negative predictive values. We suspect this is because the total scores are contaminated by items that are irrelevant to the probability of absconding but may be relevant to clinical decision-making. Moreover, the subjective rating of "overall likelihood of absconding" was significantly associated with absconding outcome, indicating that the tool was very useful overall for making an informed holistic judgment. As an SPJ tool, cutoff scores are not generally utilized, and appropriate privileges and restrictions should be based on the individual risk factors.

Finally, as noted above, the incidence of absconding is very low. Prediction of rare events is difficult. Nonetheless, we feel the matched design of the current study demonstrated the utility of the instrument. Any prospective study would similarly face the problem of low base rate. While the blinded design provided unbiased scoring, a prospective study will face the challenge of any instrument making staff more aware of absconding, which means changes in absconding rates could be related to the increased focus on the problem rather than the tool's utility.

Further study of the BEAT is required. While the BEAT was able to differentiate absconders from non-absconders, it did not show an ability to predict absconding episodes for absconders. A prospective design might allow for a more accurate rating of these individuals. We also hope to gain insights about the team's, clinicians', and patients' perceptions of the tool. It is unclear if the BEAT will have additive value to other risk assessment tools such as the HCR-20 or how the tool will affect clinical practice. Finally, we suspect that, although there may be different factors in non-forensic absconding, there may be some benefit for the BEAT in other populations who are held under restricted liberty, such as those with autism spectrum and intellectual disability, adolescents, elderly patients with dementia, civilly hospitalized or detained patients, those in correctional facilities, and those on parole.

## Conclusions

Absconding remains an important but understudied entity in forensic psychiatry. The fallout for patients, the clinical team, the hospital, the forensic system, and society at large can be monumental. Although absconding is rare, a systematic and legally defensible approach to assessing risk of absconding is required.

We have examined an absconding population, which has confirmed that events are relatively rare, as are adverse events relating to absconding. We have also examined the utility of an in-depth assessment tool for assessing absconding risk, the BEAT. The tool was easy to administer and to score. In addition, despite the limitations of a retrospective and blinded design, the BEAT showed fair ability to differentiate absconders from non-absconders, which suggests that the BEAT could provide an important tool in risk assessment and management.

Given the promising results, next steps include a prospective study involving clinical team members who are familiar with patients in routine scoring. This approach will considerably improve the BEAT's ecological validity and will provide further evidence for implementation in forensic inpatient practice.

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