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# Impact of Screening, Brief Intervention, and Referral to Treatment on Entrance to Chemical Dependency Treatment

## *Medicaid Patients Screened in Hospital Emergency Departments*

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*Report to the Division of Behavioral Health and Recovery (DBHR), David Dickinson, MA, Director; Alice Huber, PhD, Evaluation and Quality Assurance Administrator*

One of the main goals of the Washington State Screening, Brief Intervention, and Referral to Treatment (WASBIRT) Project was to improve admissions to chemical dependency (CD) treatment among hospital Emergency Department (ED) patients who received a brief intervention (BI) for substance use disorders. To assess how well the project achieved this goal, patients with publicly funded medical assistance who received at least a BI through one of nine WASBIRT hospitals between April 2004 and June 2008 were compared to statistically matched publicly funded patients treated in hospital EDs during the same time period who were not screened through WASBIRT. The odds of obtaining CD treatment were significantly higher for those who received at least a BI relative to their matched counterparts, and this finding was consistent across three distinct client populations served by DSHS: the working-age disabled, recipients of General Assistance-Unemployable (GA-U), and those on Temporary Assistance for Needy Families (TANF).

## Key Findings

This report analyzes the odds of entering CD treatment within 90 days of receiving at least a BI in an ED setting. Across three Medicaid populations, WASBIRT patients were more likely to enter treatment.

- **Working-age disabled patients who received a BI had 2.6 times the odds of entering CD treatment** compared to their matched counterparts. The subset of these patients who had not received CD treatment in the two years prior to receiving a BI had odds of going to treatment that were 3.5 to 1 compared to their matched peers.
- **General Assistance-Unemployable (GA-U) patients who received a BI had 3.2 times the odds of entering CD treatment** compared to their matched peers. The subset who had not received CD treatment in the prior two years had odds of entering treatment that were 3.1 times higher.
- **Temporary Assistance for Needy Families (TANF) patients who received a BI had 3.2 times the odds of entering CD treatment** compared to patients in the comparison group.[1] The subset who had not received CD treatment in the year prior to receiving a BI had odds of entering treatment that were 4.6 times higher relative to the comparison group.
- **The pooled group of working-age disabled, GA-U, and TANF patients who received brief therapy following a BI had 3 times the odds of entering treatment** compared to individuals with the same levels of substance abuse risk who received only brief intervention.

[1] A relatively small number of clients in the TANF group were eligible for Medicaid through non-TANF programs for pregnant women or children who were age 18 at the time of the ED visit.

## OUTCOMES | Effect of Brief Intervention

We used statistical modeling to estimate the impact of receiving a brief intervention (BI) through WASBIRT on the odds of entering CD treatment within 90 days of the index ED visit. We controlled for basic demographics (age, gender, and race/ethnicity), county of residence or service, and whether or not the patient was injured in the index month. We also controlled for the following pre-period measures: months of enrollment in ABD, GA-U, or TANF medical coverage, an indicator of need for CD treatment, receipt of CD treatment, prior arrests, prior ED visits, prior injuries, prior medical risk (expected future medical costs), and diagnoses for liver disease, poisoning, and depression.[2] In addition, for TANF patients, we included a control variable that was an indicator of whether or not an individual had any diagnoses or procedures in their medical claim or encounter records indicating a pregnancy or delivery in the index month or eight months prior to it. Overall, the unadjusted differences we observe between the WASBIRT group and the comparison group tend to mirror the regression-adjusted differences. This suggests that the matching process itself likely removed much of the observable "selection bias" (that is, the greater likelihood of patients with certain characteristics receiving a BI).

We observe three major findings across the three client populations. First, WASBIRT patients consistently have higher odds of entering CD treatment relative to their matched counterparts. Secondly, patients in *both* the WASBIRT *and* comparison group are more likely to receive treatment within 90 days of the index event if they had CD treatment in the prior year (TANF clients) or two years (working-age disabled and GA-U clients). Lastly, we find that among working-age disabled and TANF clients, WASBIRT patients who have *not* had CD treatment in recent history have greater odds of entering CD treatment following a BI compared to their matched counterparts.

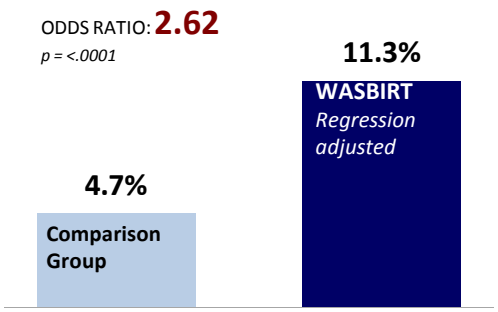
### *BI Links Working-Age Disabled Patients to CD Treatment*

Among working-age disabled adults, the odds of entering CD treatment within 90 days of receiving a BI were 2.6 times higher relative to similar patients treated in EDs who did not receive BIs. The effect of WASBIRT on linking patients to CD treatment was even greater among the subset of working-age disabled patients who had not received CD treatment in the two years prior to the index ED visit. For these patients, the odds of entering CD treatment were more than 3 to 1 when compared to their matched peers.

FIGURE 1

**Working–age disabled WASBIRT patients more likely to enter CD treatment**

*Odds of entering CD treatment within 90 days of receiving a BI*




| Working-Age Disabled Patients<br>*TOTAL = 5,034* | | | | | |
|---|---|---|---|---|---|
| **WASBIRT vs. Comparison Group** | **Comparison** | **WASBIRT** *Unadjusted* | **Odds Ratio Point Estimate** | **WASBIRT** *Regression-adjusted* | **p-value** |
| **All Patients** *n=5,034* | 4.7% | 11.1% | 2.62 | 11.3% | < .0001 |
| **No Prior CD Treatment** *n=3,786* | 2.5% | 7.6% | 3.45 | 8.1% | < .0001 |
| **Prior CD Treatment** *n=1,230* | 12.7% | 21.8% | 1.97 | 22.2% | < .0001 |

[2] These pre-period measures were constructed using data from the 24 month period prior to the index month for working-age disabled and GA-U patients and from the prior 12 month period for TANF patients.

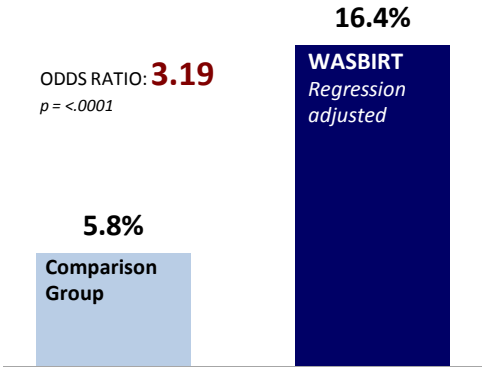
### *BI Links GA-U Patients to CD Treatment*

Among patients enrolled in GA-U, the odds of entering CD treatment within 90 days of receiving a BI were approximately 3 times higher relative to similar patients treated in EDs who did not receive BIs. WASBIRT patients enrolled in GA-U who had not received CD treatment in the prior 24 month period also had odds of entering treatment following a BI that were about 3 to 1 when compared to their matched counterparts.

FIGURE 2

**GA-U WASBIRT patients more likely to enter CD treatment**

*Odds of entering CD treatment within 90 days of receiving a BI*




| GA-U Patients<br>*TOTAL = 1,556* | | | | | |
|---|---|---|---|---|---|
| **WASBIRT vs. Comparison Group** | **Comparison** | **WASBIRT** *Unadjusted* | **Odds Ratio Point Estimate** | **WASBIRT** *Regression-adjusted* | **p-value** |
| **All Patients** *n=1,556* | 5.8% | 15.9% | 3.19 | 16.4% | < .0001 |
| **No Prior CD Treatment** *n=1,198* | 4.5% | 12.4% | 3.14 | 12.9% | < .0001 |
| **Prior CD Treatment** *n=342* | 12.9% | 25.2% | 2.26 | 25.0% | 0.01 |

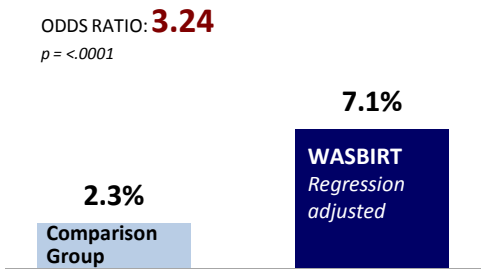
### *BI Links TANF Patients to CD Treatment*

The findings for WASBIRT patients enrolled in TANF mirror those of working-age disabled clients described above. For this client population, the odds of entering CD treatment within 90 days of receiving a BI were approximately 3 times higher relative to similar patients treated in EDs who did not receive BIs. Moreover, WASBIRT patients enrolled in TANF who had not received CD treatment in the prior 12 month period had even greater odds of entering CD treatment after a brief intervention. In this case, the odds were over 4 to 1 when compared to individuals in the comparison group.

FIGURE 3

**TANF WASBIRT patients more likely to enter CD treatment**

*Odds of entering CD treatment within 90 days of receiving a BI*




| TANF Patients<br>*TOTAL = 7,604* | | | | | |
|---|---|---|---|---|---|
| **WASBIRT vs. Comparison Group** | **Comparison** | **WASBIRT** *Unadjusted* | **Odds Ratio Point Estimate** | **WASBIRT** *Regression-adjusted* | **p-value** |
| **All Patients** *n=7,604* | 2.3% | 6.3% | 3.24 | 7.1% | < .0001 |
| **No Prior CD Treatment** *n=6,992* | 1.2% | 4.8% | 4.56 | 5.1% | < .0001 |
| **Prior CD Treatment** *n=564* | 10.6% | 23.4% | 2.57 | 23.4% | .0001 |

## OUTCOMES | Effect of Brief Therapy

Beyond brief intervention, patients with AUDIT and DAST screening scores that placed them at higher risk for substance abuse were referred to brief therapy (BT), which involved approximately four to twelve follow-up sessions with a counselor who continued to employ motivational interviewing techniques. Brief therapists provided additional support to WASBIRT patients as they attempted to reduce their substance use or abstain altogether. These therapists also referred patients to treatment – and helped remove barriers to entering treatment – for those determined to be chemically dependent.

To analyze the additional effect of BT in linking patients to CD treatment, we pooled working-age disabled, GA-U, and TANF patients together and restricted the study population to WASBIRT patients who received at least a BI. For the purposes of this analysis, we defined the treatment group as individuals who received BT within 30 days of the BI. The comparison group was defined as individuals who received BI but not BT. Once again, we estimated the odds of entering CD treatment within 90 days of the index ED event.

It is important to note that individuals who receive BT have more severe substance abuse problems by design and so are more likely to need CD treatment relative to those with lower risk levels. Therefore, it was important to match individuals in the BT group with individuals who received only BI but who had similar levels of risk based on (1) AUDIT and DAST scores, (2) an indicator of prior need for CD treatment constructed from administrative data, and (3) whether or not they had received CD treatment in the past. In addition, the regression analysis controlled for these three factors.

### *Brief Therapy Links Working-Age Disabled, GA-U, and TANF Patients to CD Treatment*

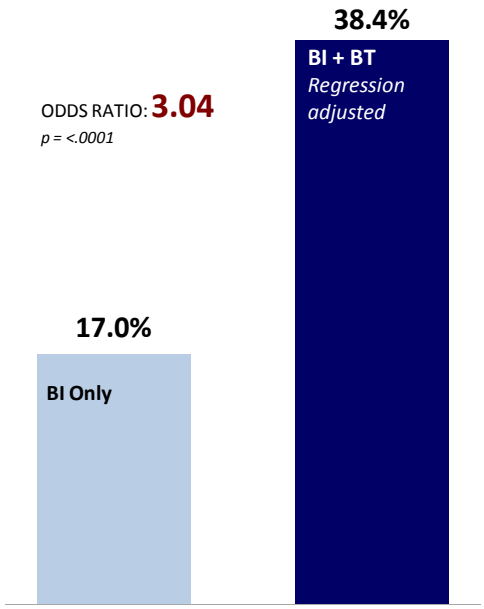
The analysis of the effect of BT on receipt of CD treatment pooled working-age disabled, GA-U, and TANF patients due to the smaller number of observations available. In addition to the fact that only a subset of WASBIRT patients who received a BI also received BT, there were also a limited number of individuals in the comparison group who had similar risk levels but received only a BI. Thus, pooling information from the three client populations allowed us to get a credible 1:1 match.

The findings from this analysis suggest that, among patients who have received a BI, BT may play an important role in linking patients to CD treatment. The odds of entering CD treatment were 3 times higher for those who received a BI plus brief therapy when compared to a matched group of individuals who received only a BI.

FIGURE 4

**WASBIRT patients enrolled in ABD, GA-U, and TANF more likely to enter CD treatment after receiving a Brief Intervention + Brief Therapy**

*Odds of entering CD treatment within 90 days of receiving a BI*




| Working-Age Disabled, GA-U, and TANF Patients<br>*Total n=806* | | | | | |
|---|---|---|---|---|---|
| **BI + BT vs. BI Only** | **Comparison** | **WASBIRT** *Unadjusted* | **Odds Ratio Point Estimate** | **WASBIRT** *Regression-adjusted* | **p-value** |
| **All Patients** *(n=806)* | 17.0% | 35.3% | 3.04 | 38.4% | < .0001 |

## DISCUSSION | WASBIRT Links Patients to CD Treatment

The findings presented in this report are encouraging and suggest that screening, brief intervention, and referral to treatment offered in an ED setting can help link Medicaid patients to needed CD treatment. To summarize, working-age disabled, GA-U, and TANF patients who received a BI through WASBIRT experienced significantly increased odds of entering CD treatment within 90 days of the index ED visit compared to their statistically matched peers. The odds of entering treatment were even higher among the subset of WASBIRT patients in two of the client populations (TANF and working-age disabled) who had not received treatment in the prior one or two years, respectively.

For many Medicaid patients who receive care through hospital Emergency Departments, this setting could provide an important venue in which to identify potential substance use disorders using simple self-report screening tools like those used in the WASBIRT project. Furthermore, providing brief interventions, brief therapy sessions, and referrals to CD treatment to ED patients identified as having possible substance use disorders could motivate these patients to seek treatment for their alcohol or drug use problem. In turn, linking these individuals to needed CD treatment may be a critical step to improving their overall health and well being.

**STUDY POPULATION | Working-Age Disabled, GA-U, and TANF Medicaid Patients**

This report examines outcomes for working-age disabled, GA-U, and TANF Medicaid patients who received a BI through WASBIRT in an emergency department (ED) setting between April 2004 and June 2008. For both WASBIRT patients and a comparison group constructed from DSHS administrative data, an "index ED event" (defined below) is used as the reference point for this analysis. We constructed a comparison group from the pool of individuals who (1) were age 18 to 64 at the time of the index ED visit and alive 12 months later, (2) had at least one month of Medicaid (non-dual Medicare) coverage under one of these three programs in the pre-period and at the index ED visit,[3] (3) had at least one emergency department visit between April 2004 and June 2008 that did not occur while the patient was in the midst of a CD treatment episode,[4] (4) resided or were treated in one of the six WASBIRT counties, and (5) were not screened through WASBIRT.

In the next step, we used a statistical technique known as propensity score matching to match each WASBIRT participant with the one individual in the comparison group sampling frame who was most similar to them on a variety of measures available in our administrative data. This information was used to predict the probability (propensity) that an individual received a BI. Individuals in the treatment group were excluded from the analysis if a suitable match could not be identified. A separate one-to-one matched sample was created for each client population (ABD, GA-U, and TANF) and for sub-analyses based on patients' prior CD treatment histories. In addition, a separate matched sample was created for the analysis of the effect of brief therapy among the population of WASBIRT patients enrolled in ABD, GA-U, or TANF who received at least a BI. This resulted in ten separate matched samples.

The index ED visit is a significant construct we use as a reference point for both pre- and post-period measures. For WASBIRT patients, we defined the first ED visit in which a BI occurred during the study time interval as the index ED visit and defined the month in which that visit occurred as the index month. For the comparison group, we randomly selected ED visits from the set of visits that occurred between April 2004 and June 2008. Given that the implementation of WASBIRT began at different time periods across the nine intervention hospitals, the statistical matching process took into account the county and month in which the ED visit occurred, as well as the interaction between these two variables. This ensured a comparable distribution of index months and counties for both the treatment and comparison groups.

**Study Description**

This report provides an analysis of the odds of entering CD treatment among individuals who were screened and received a brief intervention in one of nine emergency departments through the Washington State Screening, Brief Intervention, and Referral to Treatment (WASBIRT) project between April 2004 and June 2008 compared to a matched comparison group composed of individuals from the six WASBIRT counties who were treated in emergency departments during the same time period but who did not get screened.

**Selection Criteria for Persons Included in Analyses**

*Overall Selection Criteria for Both Groups:*

- Aged, Blind or Disabled (ABD), General Assistance-Unemployable (GA-U), and Temporary Assistance for Needy Families (TANF) clients enrolled in one of these three programs at the time of the index ED visit
- At least 1 month of ABD or GA-U eligibility in the 24 months prior to the index month for ABD and GA-U patients, respectively, and at least 1 month of TANF eligibility in the 12 months prior to the index month for TANF patients
- Dual Eligibility Exclusion: excluded clients with any period of dual Medicaid-Medicare eligibility
- Age: 18-64 at the time of the index ED visit
- Alive 12 months after the index month
- Not in the midst of a CD treatment episode (defined as treatment activities occurring within a 30 day time period) at the time of the index ED visit

*WASBIRT Intervention Group:*

- Received a brief intervention and may have also received brief therapy
- Screening period: April 2004—June 2008
- Index Event: 1st screening for which at least a brief intervention was received
- Excluded 388 participants whose risk score was below standard AUDIT and DAST cutoffs even if they received a BI

*Comparison Group:*

- Emergency Department Use: at least one ED visit between April 2004 and June 2008
- Patients not screened by WASBIRT
- County: resident of one of six WASBIRT counties (Clark, King, Pierce, Snohomish, Thurston, Yakima)

[3] Patients were categorized into the program in which they were enrolled at the time of their index ED visit. In addition, working-age disabled and GA-U clients had to have been enrolled in ABD or GA-U, respectively, at least one month in the prior two years. TANF clients had to have been enrolled in TANF at least one month in the prior year.

[4] Treatment episodes are defined here as CD treatment activities occurring within a 30 day time period.

**Regression Analyses**

Logistic regression models estimated the probability of receiving a BI. Propensity scores obtained from these models were then used to create one-to-one matched samples for each analysis (10 in total). Next, separate logistic regressions estimated the odds of entering CD treatment within 90 days of the index ED visit for WASBIRT patients compared to their matched peers. Many of the same variables were included in the second set of logistic regressions as in the first (propensity score) regression models. Due to differences in the data we are able to observe for fee-for-service (ABD and GA-U) and managed care (TANF) patients, the pre-period measures included in both sets of models were based on data from the prior 24 month period for ABD and GA-U patients and from the prior 12 month period for TANF patients. The following measures were included in both sets of models:

- Demographics: age, gender, race, county
- Potential need for CD treatment based on medical diagnoses, arrests for alcohol or drug-related offenses, detoxification, or receipt of CD treatment in the pre-period
- Prior arrests
- Prior health risk scores: risk indicator based on diagnoses and prescriptions
- Prior medical use: treatment for injuries and ED use
- Diagnoses for liver disease, injuries in the index month, depression, and poisoning
- For TANF patients only, diagnoses and procedures indicating a pregnancy or delivery in the index month or eight months prior to it
- Prior Medicaid eligibility: number of months enrolled in ABD, GA-U, or TANF medical coverage in the 24 months prior to the index month

**Criteria for Level of Intervention**

| | RECOMMENDED INTERVENTION | | | |
|---|---|---|---|---|
| | **Screen Only** | **BI Only** | **BT** | **CD Tx** |
| **Screening scores** | | | | |
| AUDIT - Female | Less than 7 | 7-15 | 16-19 | 20-40 |
| AUDIT - Male | Less than 8 | 8-15 | 16-19 | 20-40 |
| DAST | 0 | 1-4 | 5-7 | 8-10 |

## Descriptive Information on Study Population Following 1:1 Matching

| | ABD | | GA-U | | TANF | |
|---|---|---|---|---|---|---|
| | STUDY GROUP | | | | | |
| **CHARACTERISTIC** | **WASBIRT** *n = 2,517* | **Comparison** *n = 2,517* | **WASBIRT** *n = 778* | **Comparison** *n = 778* | **WASBIRT** *n = 3,802* | **Comparison** *n = 3,802* |
| **Age**[*] | 40 (12) | 40 (13) | 39 (10) | 39 (10) | 27 (8) | 27 (9) |
| **County of residence** | *Percentages* | | | | | |
| Clark | 9.69 | 9.50 | 6.04 | 4.24 | 19.17 | 19.36 |
| King | 29.20 | 28.57 | 42.54 | 43.44 | 4.52 | 4.10 |
| Pierce | 18.87 | 19.79 | 15.42 | 15.17 | 24.15 | 24.75 |
| Snohomish | 16.41 | 15.85 | 19.02 | 18.51 | 17.94 | 18.39 |
| Thurston | 8.70 | 8.54 | 6.17 | 7.46 | 8.13 | 8.36 |
| Yakima | 17.32 | 17.56 | 11.31 | 10.67 | 26.09 | 25.04 |
| **Male** | 58.56 | 57.01 | 68.25 | 68.12 | 24.80 | 25.30 |
| **Race/ethnicity** | | | | | | |
| White | 69.01 | 68.57 | 64.14 | 63.11 | 67.44 | 66.39 |
| Black | 16.85 | 16.37 | 20.44 | 22.24 | 9.31 | 9.42 |
| Other | 14.14 | 15.06 | 15.42 | 14.65 | 23.25 | 24.20 |
| **Prior indication of need for CD treatment** | 60.87 | 59.48 | 57.58 | 57.46 | 20.75 | 21.17 |
| **Prior health risk score** (*not* %) | 1.61 (1.50) | 1.58 (1.48) | 0.85 (0.91) | 0.84 (0.97) | 0.59 (0.64) | 0.58 (0.62) |
| **Prior diagnosis of poisoning** | 17.68 | 17.60 | 7.33 | 8.23 | 2.39 | 2.66 |
| **Prior CD Treatment** | 24.91 | 20.58 | 23.26 | 22.75 | 7.84 | 7.94 |
| **Prior arrest** | 41.64 | 41.56 | 47.56 | 47.17 | 15.99 | 16.86 |
| **Prior depression** | 42.11 | 41.12 | 28.15 | 27.76 | 15.47 | 14.99 |
| **Prior liver-related diagnosis** | 12.99 | 12.59 | 7.07 | 5.78 | 1.39 | 1.26 |
| **Prior injury** | 66.94 | 68.26 | 50.00 | 52.19 | 37.64 | 39.64 |
| **Prior ED visits** | 82.80 | 83.00 | 62.60 | 63.50 | 58.55 | 59.60 |
| **Prior pregnancy or delivery** | N/A | N/A | N/A | N/A | 20.44 | 19.88 |
| **Months of ABD/GA-U/TANF eligibility** in year or two years prior to the index month | 18.23 | 18.46 | 9.01 | 9.34 | 9.02 | 8.98 |

[*] Standard deviation in parenthesis.

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