

# TRAUMATIC BRAIN INJURY AMONG HOMELESS PERSONS

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*Etiology, prevalence and severity*

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HEALTH CARE FOR THE HOMELESS  
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### ORDERING INFORMATION

This monograph and other publications on homelessness and health care may be ordered directly through the Health Care for the Homeless Clinicians' Network, National Health Care for the Homeless Council; telephone 615/226-2292; [www.nhchc.org](http://www.nhchc.org). Readers may download *Traumatic brain injury among homeless persons: Etiology, prevalence and severity* without cost online at [www.nhchc.org](http://www.nhchc.org).

### ABOUT THE HCH CLINICIANS' NETWORK

Founded in 1994, the Health Care for the Homeless Clinicians' Network is the collective voice for hands-on care providers who work to end homelessness and improve the lives of our homeless neighbors. The Network represents the diverse clinical disciplines that work in homeless health care, and provides member services including publications, education and training, practice-based research, and peer support, all with the express intent of improving and enhancing clinical practice. Direction and leadership for the Network comes from a member-elected Steering Committee. The National Health Care for the Homeless Council, Inc., operates the Network through a cooperative agreement with the Health Resources & Services Administration; additional support comes from membership dues, contributions and the Substance Abuse & Mental Health Services Administration. To learn more or to become a member, visit our website at [www.nhchc.org](http://www.nhchc.org).

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## PREFACE

This monograph describes the etiology, prevalence and severity of cognitive dysfunction as a result of traumatic brain injury (TBI) among persons experiencing homelessness. It is hoped that this information will improve our ability to identify, assess, diagnose, treat, house and create aftercare services for those homeless persons who have sustained TBI and other insults to the central nervous system. The paper concludes with a series of practice, administration and policy recommendations.

After studying a cohort of 90 homeless men in Wisconsin, of whom 80% were found to have evidence of cognitive impairment, Solliday-McRoy, Campbell, Melchert, Young and Cisler (2004) stated the following:

Given the growing evidence . . . an underdiagnosis and inappropriate treatment problem of crisis proportions may exist in th[e homeless] population. Further clarification of the size and nature of this problem could have a major effect on the allocation of funding and level of staff training needed for developing, implementing, and evaluating appropriate services for homeless people. Without more attention to these issues, homelessness will continue to persist as a pervasive social problem that creates a massive amount of preventable suffering.<sup>1</sup>

## WHAT ARE THE LINKS BETWEEN ADVERSE CHILDHOOD EXPERIENCES, HOMELESSNESS AND TRAUMATIC BRAIN INJURY?

After practicing psychiatry with homeless persons for the past seven years, it is clear that a large percentage of the chronically homeless population has experienced abusive and chaotic family backgrounds, profoundly affecting their ability to function in society as adults. Often, these men and women have lived in multiple family constellations from a very young age, moving from relative to relative, with stays in foster care and juvenile detention. They were raised by parental figures stretched to the limits of their financial and emotional resources, and are overwhelmingly victims of childhood physical and emotional abuse.<sup>2</sup> The combination of a chaotic childhood and chronic abuse were major factors that prevented proper learning from taking place in school, resulting in academic failure and illiteracy. Chronic substance abuse, street violence and untreated systemic disease compounded these problems and led to inability to compete in the job market and chronic homelessness.

Research indicates that the most common risk factors for homelessness include:

- Histories of foster, group and institutional care,<sup>3</sup>
- Childhood physical, emotional and sexual abuse,<sup>4</sup>
- Neglect in childhood,<sup>5</sup>
- Substance abuse in the family of origin,<sup>6</sup>
- Homelessness in the family of origin,<sup>7</sup>
- High use of inpatient psychiatric and medical services,<sup>8,9</sup>
- Low levels of education,<sup>10</sup>
- Substance abuse,<sup>11</sup> and
- Mental illness.<sup>2,12</sup>

Many of these risk factors have their origins in childhood and adolescence and are likely to have set the stage for the development of major problems later in life.<sup>13</sup> Although these risk factors are well-known, one of the most common sequelae of these experiences—traumatic brain injury—often goes undetected among homeless persons.

### WHAT IS TRAUMATIC BRAIN INJURY?

The National Dissemination Center for Children with Disabilities defines traumatic brain injury as being:

an injury to the brain caused by the head being hit by something or shaken violently. This injury can change how the person acts, moves, and thinks. A traumatic brain injury can also change how a student learns and acts in school. The term traumatic brain injury is used for head injuries that can cause changes in one or more areas, such as thinking and reasoning, understanding words, remembering things, paying attention, solving problems, thinking abstractly, talking, behaving, walking and other physical activities, seeing and/or hearing, and learning. The term traumatic brain injury is not used for a person who is born with a brain injury. It also is not used for brain injuries that happen during birth.<sup>14</sup>

The Individuals with Disabilities Education Act (IDEA) defines traumatic brain injury as:

an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. The term applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual, and motor abilities; psycho-social behavior; physical functions; information processing; and speech. The term does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma [34 Code of Federal Regulations §300.7(c)(12)].<sup>15</sup>

The second issue of *TBI Research Review: Policy & Practice* (2006), which focused on unidentified traumatic brain injury, opens with this insight as to how brain injury can remain hidden:

Millions of people have experienced a traumatic brain injury, but they are unaware that traumatic brain injury is the underlying cause of problems they subsequently experience, such as poor memory, difficulties in learning and behavioral changes. These individuals had a blow to the head, were dazed and confused, perhaps even lost consciousness, perhaps got medical attention and then went on with their lives.<sup>16</sup>

### HOW DOES TRAUMATIC BRAIN INJURY OCCUR IN HOMELESS PERSONS?

After performing over 3,000 comprehensive psychiatric evaluations of persons experiencing homelessness, most of whom had spent the past year or more on the street, in a shelter, drop-in center or other transitional setting, a striking commonality became evident to this writer. At least half of the patients reported histories of blows to the head sustained in the context of severe childhood physical abuse, and, less frequently, in the context of childhood motor vehicle

accidents, falls and accidents while playing sports. Most of the persons reporting blows to the head also reported subsequent difficulties with memory, attention and impulse control, often with concomitant placement in special education classes, either for behavioral difficulties or academic failure. Very few reported having finished high school, and those who joined the military were often unable to complete their initial tour of duty due to these cognitive and behavioral difficulties.

These individuals frequently reported that the injuries they suffered as children as well as their neuropsychological sequelae often went unreported and untreated as a result of abusive parents attempting to conceal their injuries as well as the impoverished circumstances in which they were raised, with no access to affordable medical care or health insurance coverage. (Some of the emotional sequelae of childhood abuse are post-traumatic stress disorder, the depressive disorders and the entire array of substance use disorders. This article, however, is limited to addressing the cognitive dysfunction that often results from traumatic brain injury.)

### TRAUMATIC BRAIN INJURY AND SOCIAL FAILURE

Current reviews of research on brain injuries conclude that those who have sustained brain injuries are at high risk of social failure. *TBI Research Review*, a publication of the TBI Model System at Mount Sinai School of Medicine, reports:

Traumatic brain injury is strongly associated with multiple, often overwhelming, challenges that can undermine the person's efforts to live a healthy, productive life. Combined, these challenges often result in the person with traumatic brain injury becoming a 'social failure.' At the extreme, Lewis and colleagues (1986)<sup>17</sup> found that all of the inmates they interviewed on death row had experienced one or more TBIs. Among prisoners in general, estimates of TBI range from 42 percent to 87 percent,<sup>18,19,20</sup> with most of these brain injuries preceding the start of criminal activity. TBI is also common in inpatient psychiatric populations and, similarly, the TBI usually precedes onset of psychiatric symptoms.<sup>21,22</sup> TBI is associated with high levels of depression and anxiety<sup>23</sup> and those with TBI attempt suicide four times more often than do those with no brain injury.<sup>24</sup> Additionally, those who abuse substances often have a history of early TBI.<sup>25,26</sup> Simpson and Tate (2005)<sup>27</sup> found suicide 21 times more likely in those with combined TBI, substance abuse and major depression. Finally, children with TBI are at increased risk for social failure as they mature into adulthood. TBI in children is associated with poor academic performance<sup>28</sup> as well as problem behaviors.<sup>29</sup> Glang and colleagues (2004)<sup>30</sup> estimate that 130,000 U.S. children need special education classes because of TBI, but that only 11 percent are currently enrolled. The United States Department of Education reports that 24,000 schoolchildren have been identified with a TBI, but the current estimate is that there should be 500,000, indicating that less than 5 percent have been identified (W. A. Gordon, personal communication, June 5, 2008). These children truly remain 'hidden' to their schools.<sup>16</sup>

Homelessness is comorbid with all of the conditions mentioned: incarceration, psychiatric symptomatology, substance abuse and school failure or placement in special education, yet no protocol is in place to routinely screen those experiencing homelessness for traumatic brain injury or its neuropsychological sequelae.

## COST OF HOMELESSNESS

At present, the impact of traumatic brain injury and cognitive dysfunction on the cost of homelessness cannot be calculated, since the research that would bring those costs to light has yet to be undertaken. Much is known, however, about the cost of homelessness in general. In many cities, homeless persons live in street, shelter, hospital, detox and jail in a cyclical fashion at great cost to themselves and society. In terms of medical care, homeless persons tend to use the most expensive interventions: Emergency settings, psychiatric units and detoxification facilities. On average, studies report that homeless persons spend four more days in hospital each year than non-homeless people.<sup>31</sup> To extrapolate, at current cost estimates it is possible that the 33,500 persons who are presently homeless every night in New York City generate \$335 million more in hospital fees annually than non-homeless persons do.

Studies reveal that homeless persons also spend a disproportionate amount of time in jail and prison. In 2005, a year in prison cost an average of \$23,876.<sup>32</sup> Additionally, homeless shelters cost far more on average than does permanent housing: About \$1,250 per month to shelter single persons and \$2,000 to \$2,500 per month for families in homeless shelters. For comparison, in New York City, permanent, supportive housing for eligible formerly homeless persons costs \$215 per month. A recent study of long-term homelessness found that: “The 150,000 chronically homeless people in the United States cost \$10.95 billion per year in public funds. If these individuals were all permanently housed, the expense would be expected to fall to \$7.88 billion.” The study estimated that approximately 90% of these costs are comprised of medical care for this vulnerable population.<sup>33</sup>

One of the causes of frequent use of high-cost medical services by homeless persons may be ease of access. In New York City, for example, hospital emergency departments cannot refuse uninsured persons medical care whereas in an outpatient setting, those who cannot pay will not be seen. Identification of cognitive dysfunction in homeless persons can enhance their ability to obtain SSI/SSD disability entitlements, which guarantees stable health insurance in the form of Medicaid and/or Medicare and may serve to curtail inappropriate emergency room use and avoidable hospitalizations.<sup>34</sup>

## COURSE AND PROGNOSIS

In general, the deficits in cognitive functioning incurred by traumatic brain injury are static. If further insult to the central nervous system occurs, however, as is often the case among homeless persons, further decrement in functioning will likely take place. Factors most likely to exacerbate the effects of traumatic brain injury among homeless persons include:

- Further injury, usually in the context of domestic, street or prison violence
- Chronic substance abuse, which even in the absence of traumatic brain injury can cause cognitive impairment, e.g., alcohol-induced persisting dementia (previously known as Korsakoff's dementia)
- Untreated systemic disease such as syphilis or HIV
- Malnutrition
- Complex mental health disorders



Thus, a homeless person with evidence of traumatic brain injury who has been abstinent from drugs and alcohol for a number of years and is able to avoid violent situations will likely remain at his or her current level of functioning, or even improve, if enrolled in a program of cognitive rehabilitation. On the other hand, persons with histories of traumatic brain injury who continue to drink and use substances may continue to experience declining cognitive functioning as long as the substance abuse continues.

## HOW IS IT THAT WE FAIL TO DETECT TRAUMATIC BRAIN INJURY IN HOMELESS PERSONS?

*What we observe is not nature itself but nature exposed to our method of questioning.*  
—W. Heisenberg<sup>35</sup>

### Medical professionals don't ask

There are two ways to detect traumatic brain injury:

- Through direct questioning, revealing a history of a blow or blows to the head, or
- By neuropsychological testing, which can reveal as well as measure deficits in cognitive functioning secondary to traumatic brain injury or other insults to the central nervous system.

Busy clinic settings, as well as high-pressure emergency departments, are less than ideal for the time-intensive interviewing necessary to elicit accurate histories of past head trauma. In addition, history-taking in the course of a medical examination does not include a line of inquiry to elicit history of physical abuse unless unexplained injuries present themselves,<sup>36</sup> an unlikely situation for homeless persons with a history of physical abuse far in the past, in childhood.

Upon eliciting a history of head trauma, many clinicians order scans rather than neuropsychological testing. However, according to Steven Flanagan, MD, Chair of the Department of Rehabilitation Medicine at New York University Medical Center, “if there is only microscopic injury to the brain, which can happen after traumatic brain injury (although not always), a standard CT or MRI will appear normal, even though there could be considerable injury.” Regarding positron emission tomography, he added: “PET scans of the brain are abnormal in many conditions, including psychiatric disorders. Therefore, one cannot distinguish an abnormal scan resulting from traumatic brain injury from one caused by another condition. In short, it is not useful in diagnosing traumatic brain injury.”<sup>37</sup>

Even when clinicians detect evidence of cognitive dysfunction as a result of reported traumatic brain injury, many communities lack the resources for conducting neuropsychological testing. Finally, it is important to understand that clinical judgment alone cannot be relied upon to gauge the severity of cognitive impairment, since even persons with significant deficits in cognitive functioning can often appear to be very high functioning because of superior communication skills.<sup>38</sup>

### Mental health professionals don't ask

History-taking in the course of the clinical examination in psychiatry also does not generally include questions about abuse, trauma or neglect.<sup>39</sup> Psychiatric evaluations do not generally call for the neuropsychological testing necessary to determine the severity of the deficits in functioning that arise as a result of childhood physical abuse. The Folstein Mini-Mental State Exam (MMSE)<sup>40</sup> is a relatively insensitive screening tool and the tool that is almost universally used in clinical practice to detect altered mental status. Psychiatrists conceivably could attain the training in residency necessary to recognize disorders common among homeless persons, including traumatic brain injury. A survey of psychiatric residency programs conducted in 2004, however, revealed that although 60% of the 106 programs surveyed reported “educational offerings” in homelessness, only 20% had clinical offerings, of which only 11% were mandatory.<sup>41</sup>

### How did this situation come to be?

Historically, psychiatric disorders were divided into those thought to be of organic origin—which is to say, those that came about as a result of an identifiable pathologic condition, e.g., head trauma, brain tumor or infectious process—and those disorders for which there was no identifiable medical cause, then referred to as the functional disorders, comprising the psychotic, anxiety and affective disorders. In the past, neurologists diagnosed and treated organic brain disorders while functional disorders fell under the purview of psychiatry.

In recent years, however, the authors of the Diagnostic and Statistical Manual of Mental Disorders (DSM) concluded that every psychiatric disorder has some organic or biologic component at its origin. Thus, the division between organic and functional disorders was erased and the nomenclature was altered to reflect that change. Clinicians trained in the era before this reunification, however, may be unfamiliar with the cognitive disorders as a result. Since these clinicians are the primary educators of the new generation of mental health professionals, there seems to be latency in clinicians becoming aware of the proper diagnosis and treatment of these disorders.

### Researchers don't ask

A recent Medline search conducted by this writer on the keywords *homelessness and traumatic brain injury* did not return a single article. A number of peer-reviewed articles have addressed the topic of risk factors for homelessness, as mentioned earlier, and revealed childhood physical abuse as a major risk factor.<sup>3,4,5,6,7,8,11</sup> None of the studies, however, considered traumatic brain injury or its sequelae in their investigations. For example, Koegel, Melamid and Burnam (1995) report that over 50% of their sample had lived outside the family home in childhood, of whom half had been placed in “foster care, institutional settings, or both,”<sup>42</sup> but no measures of head injury or deficits in cognitive functioning were conducted. Herman, Susser, Struening and Link (1997) gathered histories of lack of care, physical abuse, sexual abuse and other kinds of adverse childhood experiences from homeless persons, but also did not gather data on traumatic brain injury.<sup>43</sup>

### Patients don't tell

An important observation emerged in a recent article on the need for substance abuse and trauma services regarding the ability of clinicians to elicit information:

Since abuse histories may not be reported until a therapeutic and trusting alliance has been established, and given the fact that the trauma data were collected during an initial psychiatric evaluation, we have reason to believe that our data reflect an underreporting of abuse on the part of the men in our program.<sup>2</sup>

Indeed, even when clinicians are well-trained in eliciting trauma histories, “Gaps are inevitable between what the patient experiences and what he/she can effectively communicate to the doctor.”<sup>44</sup> The ability to elicit a history of trauma and/or abuse is a function of the level of trust between clinician and patient, as well as the perceived emotional safety of the environment (*see Appendix C for a guide to taking a history of trauma*).

### Health care disparities

There is a widespread perception among medical and psychiatric professionals who work with homeless persons that their patients may receive substandard treatment in emergency departments because of their “homeless” appearance or other prejudices. As a result, traumatic brain injuries sustained after the onset of homelessness may also go undetected and untreated. If a homeless patient presents to ER staggering, incoherent, smelling of alcohol and unable to give any history, he/she may be diagnosed as intoxicated and observed until discharge rather than evaluated for a brain injury.

A recent study of homeless persons presenting for emergency treatment in Denver found that homeless persons were less than half as likely to be admitted to hospital, even though their incidence of medical and psychiatric disorders did not differ significantly from the non-homeless cohort of individuals who were admitted to the hospital.<sup>45</sup> In addition, despite growing evidence that even so-called “mild” TBI has further reaching implications than previously believed, many emergency departments have yet to implement screening and referral for these injuries. As a result, many patients who are treated and released from ERs with instructions to follow up only if they experience dizziness, vomiting or difficulty waking may be experiencing cognitive changes that may never be evaluated. This is a widespread phenomenon and may explain the poor functioning of some persons who fall into homelessness without clear abuse or neglect histories.

### General lack of knowledge

There seems to be a general lack of knowledge of traumatic brain injury on the part of clinicians as well as society as a whole. Increasing knowledge and understanding of traumatic brain injury is even more crucial today as a result of the significant numbers of service persons who are returning from the wars in Iraq and Afghanistan with TBIs.

### HOW PREVALENT IS COGNITIVE IMPAIRMENT AMONG HOMELESS PERSONS?

A Medline search revealed only 12 studies on prevalence of cognitive impairment among homeless persons, three of which had been conducted in the United States. A review of that body of literature reveals that as many as 80% of homeless persons tested displayed marked deficits in cognitive functioning in at least one domain: Language, immediate memory, delayed memory, visuospatial/constructional, or attention. Homeless persons have very high rates of cognitive impairment of all etiologies—premature birth, maternal drug and alcohol abuse, chronic psychiatric illness, mental retardation, traumatic brain injury, chronic substance abuse, and developmental disabilities—so it is important to understand that not all cognitive dysfunction among homeless persons is secondary to traumatic brain injury.

There have been relatively few studies of cognitive impairment that is secondary to traumatic brain injury among homeless individuals. Indeed, the total number of persons studied in all reports combined resulted in fewer than 3,500.<sup>46</sup> Spence, Stevens and Parks (2004) reported the following in *The Journal of the Royal Society of Medicine*:

The extent of executive (global) cognitive impairment in homeless adults requires further elucidation. There are only three studies pertaining to this important question.<sup>47,48,49</sup> If people are to change their circumstances, to learn new skills and break destructive patterns of behavior, then it is the executive system which is particularly implicated in such cognitive flexibility.<sup>50,51</sup> The MMSE [Mini-Mental State Exam] is not the best way to assess executive functioning and may accrue Type II errors (false negatives). There is a need for studies that utilize specific probes of executive function, e.g., the Trails B, Stroop and Wisconsin Card Sort Test. When such tests are applied, then the evidence suggests that many homeless adults are impaired (80% in the Gonzalez study).<sup>52</sup>

### HOW SEVERE IS COGNITIVE IMPAIRMENT AMONG HOMELESS PERSONS?

There are very few studies examining the severity of cognitive impairment among homeless persons, and those that have been conducted utilized a variety of neuropsychological test batteries, complicating analysis. In general, however, testing revealed scores indicative of cognitive dysfunction in 80% of homeless persons tested, more than ample evidence that neuropsychological testing should be routine in medical and psychiatric evaluations of persons experiencing or with a history of homelessness, even when no history of head trauma is elicited.

- In a study of homeless, mentally ill persons, testing conducted in reading, spelling and arithmetical computation produced scores that ranged “from the 8th to the 13th percentile . . .”<sup>53</sup>
- In an investigation of nonpsychotic homeless veterans, researchers found high rates of what they termed “occult neurological deficits.”<sup>54</sup>
- In an unpublished study of 50 homeless persons in Minnesota, psychologist Kristen Ryan found that 20 of those tested showed “moderate to severe cognitive impairment” and often reported histories of traumatic brain injury.
- In ‘A comparison of an abbreviated test battery to the Mini-Mental State Exam,’ Gonzalez, Dieter, Natalie and Tanner (2001) found that: “A high incidence of neuropsychological

dysfunction was evident with 80% of patients showing impaired test battery performance and 35% showing an impaired MMSE.”<sup>47</sup>

- In a study of 90 sheltered homeless men in Wisconsin, “The large majority of the study sample (80%) demonstrated performances on the Cognistat that suggested impaired cognitive functioning (i.e., their scores on at least one of the 10 subtests fell within the impaired range of performance).”<sup>55</sup>
- In an unpublished investigation of deficits in cognitive functioning, 97 chronically homeless persons were selected and all were tested, 90 using an established neuropsychological battery and seven using the Folstein Mini-Mental State Exam (MMSE). Eighty of the 97 reported histories of traumatic brain injury. Seventy percent of those who underwent formal neuropsychological testing scored in the 10th percentile or below in at least one domain of cognitive functioning.<sup>56</sup>
- A study of homeless schoolchildren in New York City revealed that 61% of those tested scored at or below the 10th percentile in receptive verbal functioning, 29% were functioning at the fifth percentile for age in psychomotor ability, and 38% exhibited emotional and behavioral problems.<sup>57</sup>

To summarize, in their meta-analysis of cognitive dysfunction among homeless persons, Spence et al. (2004) wrote: “most studies indicate a considerable burden of cognitive dysfunction among homeless people.” They go on to recommend: “In clinical practice, assessment of homeless adults should include their cognitive state.”<sup>58</sup>

## HOW DO DEFICITS IN COGNITIVE FUNCTIONING MANIFEST THEMSELVES?

People with traumatic brain injury can have difficulty:

- |                                     |   |
|-------------------------------------|---|
| ■ Remembering information           | ■ Regulating their emotions                         |
| ■ Keeping appointments              | ■ Having to wait                                    |
| ■ Following instructions            | ■ Paying attention                                  |
| ■ Reading                           | ■ Organizing themselves                             |
| ■ Writing                           | ■ Shopping for food                                 |
| ■ Finding their way to appointments | ■ Cooking   |
| ■ Relating to others                | ■ Maintaining good boundaries                       |
| ■ Taking medication as prescribed   | ■ Staying away from drugs and alcohol <sup>59</sup> |

Because of these difficulties, homeless persons who have suffered traumatic brain injury are often given labels such as *noncompliant*, *difficult to engage* and *poor historian*. Once neuropsychological testing is undertaken and the nature and extent of the deficits in cognitive functioning becomes known, steps can be taken to educate staff and direct care providers, such that attitudes change and pejorative terms disappear.

## HOW DO DEFICITS IN COGNITIVE FUNCTIONING STAND IN THE WAY OF PERMANENT HOUSING?

Being able to successfully negotiate the housing process in most cities often assumes that homeless persons:

- Possess good reading and writing skills,
- Have the ability to read a map,
- Can budget money,
- Can use a computer,
- Are willing to wait for long periods,
- Will remember to bring important papers,
- Own and can read a calendar,
- Are able to follow instructions,
- Can keep appointments,
- Are capable of getting along with others and
- Have a lot of patience

—some, or all of which, skills are affected in those with cognitive impairment.

In light of the prevalence as well as severity of cognitive impairment among homeless persons, agencies serving the homeless as well as the governmental agencies administering public assistance, housing, disability entitlements and the like would do well to adapt their protocols to reduce systemic barriers faced by those applicants and beneficiaries with cognitive impairment.

## IMPLICATIONS: PRACTICE, ADMINISTRATION AND POLICY RECOMMENDATIONS

In working with vulnerable populations, clinical practices and healthcare policies often change to accommodate the special needs of the population, based on what is known about the population, statistically. Examples range from the universal precautions against HIV infection practiced in clinical settings to the routine testing of persons experiencing homelessness for tuberculosis. Although the incidence of HIV and tuberculosis is far lower than the incidence of cognitive dysfunction in homeless persons tested thus far, no protocols exist mandating the routine screening of homeless persons for deficits in cognitive functioning. Until protocols are put in place, the following recommendations are in order to improve our ability to identify, assess, diagnose, treat, house and create aftercare services for those homeless persons who have sustained traumatic brain injury and other insults to the central nervous system.

*On the personal level:*

- Meet with people one-on-one, not in a room with others
- Eliminate distractions such as background music
- Refrain from answering e-mail and taking telephone calls while meeting with people
- Limit communication to one mode at a time; i.e., do not show people something new while talking to him or her about it
- Accompany people to their appointments

- Do not assume that people can read, write, read a map or do math
- Do not assume that people can negotiate public transportation
- When prescribing, use monotherapy whenever possible and use a q.d. drug over b.i.d., t.i.d. and q.i.d medications whenever possible
- Label medications for people who cannot read in a way that they can understand
- Screen and test all homeless persons for deficits in cognitive functioning
- Use neuropsychological test results to justify SSI/SSD and/or VA disability claims

*On the agency level*

- Adopt policies of trauma-informed care
- Mandate staff training on TBI and its sequelae
- Develop relationships with TBI Model System leadership in your community
- Join your local Brain Injury Association and attend their conferences
- Create partnerships with other agencies and facilities for referrals for appropriate care, such as cognitive remediation, TBI day treatment programs, trauma-informed substance abuse treatment programs and trauma-informed psychiatric care
- Inform housing providers of the special needs of those with cognitive impairment
- Place clients in congregate care settings, not alone in scatter-site apartments<sup>60</sup>
- Provide visiting aftercare services, such that disabilities do not pose obstacles to care
- Hire a neuropsychologist
- Host clinical rotations for medicine, psychiatry and nursing at agencies serving homeless persons
- Spearhead projects to gather data

*On the governmental level*

- Advocate for loosening the standards for admission to TBI Waiver programs
- Lobby state Medicaid to obtain appropriate reimbursement for neuropsychological testing<sup>61</sup>
- Streamline the SSA/VA disability application process for those with documented deficits in cognitive functioning
- Create stable funding streams for TBI services
- Fund further research into the connection between traumatic brain injury, cognitive dysfunction and homelessness

## APPENDIX A | SCREENING FOR TRAUMATIC BRAIN INJURY

Gordon et al. write:

In the general population, we know that many people experience the consequences of mild brain injury but never realize that many of their problems are due to a "long ago" blow to the head. We also know that when mild TBI is identified, whether in children or adults, appropriate services often can be brought to bear to help the person cope with persisting symptoms, particularly memory problems.

[Gordon et al.] developed the Brain Injury Screening Questionnaire (BISQ)<sup>62</sup> to address the issue of unidentified (or hidden) TBI. The BISQ is a simply administered questionnaire to determine, first, if a person has experienced a blow to the head or a medical emergency, with an associated loss of consciousness or a feeling of being 'dazed and confused.' It then uses a list of symptoms to determine if the person being screened has the kinds of persisting problems typically found after brain injury that suggest he or she should be tested (with neuropsychological tests) to determine if TBI is the likely cause of these symptoms. The BISQ is completed via interview or can be self-administered. It is electronically scorable.

The format for the BISQ is based on the "HELPS" instrument, developed by Picard, Scarisbrick, and Paluck (1991) at Mount Sinai's TBI Rehabilitation and Prevention Center. The list of symptoms in the BISQ was adapted from the TBI Symptom Checklist (Medical College of Virginia, undated) and the TIRR Symptom Checklist, created by Don Lehmkuhl (1988).

Those interested in developing a screening program—in schools, service agencies, health programs, and the like—can obtain the BISQ, with technical assistance to insure appropriate use in the variety of settings in which screening may be undertaken. Costs include training, the questionnaire itself, and scoring.

If you are an organization interested in obtaining more information about technical assistance in establishing a screening program for TBI, please e-mail Dr. Wayne Gordon at [wayne.gordon@mssm.edu](mailto:wayne.gordon@mssm.edu).<sup>63</sup>



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## APPENDIX B | NEUROPSYCHOLOGICAL TESTING

Psychological Assessment Resources, Inc., the portal where the Repeatable Battery for the Assessment of Neurological Status (RBANS) is sold, provides the following description of that test battery:

The RBANS is a brief, individually administered test that helps determine the neuropsychological status of adults ages 20 - 89 years who have neurological injury or disease such as dementia, head injury, or stroke. You can get a quick sampling of important cognitive areas using content and a format familiar to clinicians who use the Wechsler™ Scales. The overall battery length is less than 30 minutes, in order to maximize patient cooperation and to minimize the effect of fatigue on performance. In addition, the RBANS has two parallel forms, ideal for measuring change in the client's neuropsychological status over time.

The RBANS can be used in a variety of ways:

- As a stand-alone 'core' battery for the detection and characterization of dementia in the elderly.
- As a neuropsychological 'screening battery' when lengthier standardized assessments are either impractical or inappropriate.
- For repeat evaluations when an alternate form is needed to control for content practice effects.

The RBANS is useful in a variety of settings

Because the RBANS is a brief, portable and hand-scorable instrument, it is appropriate for use in a variety of settings. You can administer the RBANS for screening for deficits in acute-care settings, for tracking recovery during rehabilitation, for tracking progression in degenerative diseases, or as a neuropsychological screening for non-neuropsychologists who must make referrals to neuropsychologists. Although the RBANS was originally developed with a primary focus on assessment of dementia, it has potential utility for screening neurocognitive status in younger patients.

The RBANS enables you to examine areas of cognitive functioning and profile impairment across domains with 12 subtests including:

- List Learning
- Story Memory
- Figure Copy
- Line Orientation
- Digit Span
- Coding
- Picture Naming
- Semantic Fluency
- List Recall
- List Recognition
- Story Recall
- Figure Recall<sup>64</sup>

## APPENDIX C | A GUIDE TO INVESTIGATING COGNITIVE IMPAIRMENT IN THE CLINICAL SETTING

Homeless persons have very high rates of cognitive impairment of all etiologies: Premature birth, maternal drug and alcohol abuse, mental retardation, dementia due to head injury, substance-induced persisting dementia, and developmental delays/disabilities. If you find yourself having to reframe questions of the patient in simpler terms because of lack of comprehension or consider the patient to be a “poor historian” because of his inability to recall dates of important events, names of siblings or other vital information, begin the process of ruling out cognitive impairment.

Ask about placement in special education classes during primary and secondary education (“*Did you attend regular or special education classes?*”). Find out if the patient was ever “held back” a grade or two because of behavior, poor academic performance or other reasons. Ask “*How’s your reading?*” and “*How’s your math?*” Find out if the patient is able to write (“*How’s your handwriting?*”). Most patients will admit a history of mathematics disorder, reading disorder or disorder of written expression if asked in a non-judgmental fashion.

Elucidating the patient’s level of impairment in these areas during the interview will allow you to make informed recommendations regarding type of housing (if a variety is available) as well as the patient’s level of need for various kinds of ongoing supports: Social workers to escort him to and from appointments, cognitive remediation, occupational therapy, visiting nurses, home health aide, medication administration, literacy classes, and the like. Screening the patient using a recognized instrument, i.e., Repeatable Battery for the Assessment of Neuropsychological Status (RBANS™) or Cognistat™ (Neurobehavioral Cognitive Status Examination), can pave the way to obtaining disability benefits that can provide resources to help support eligible patients in housing.

When you reach the patient’s history during high school, ask “*How much school did you end up going to?*” rather than the usual “*When did you graduate from high school?*” which falsely assumes that the patient did graduate and often elicits a lie. Patients often attended vocational training programs after high school regardless of graduation status, and often erroneously refer to these programs as “college.” Questioning the patient along the lines of “*Did you have any more schooling after high school?*” will elicit histories of participation in Job Corps, GED completion programs (be sure to ask when they completed their GED), vocational-technical programs, as well as college.

Ask about any military service regardless of the patient’s age or gender. Ask about any disciplinary actions, Article 15s, demotions, fighting or other difficulty by asking “*Did you have any trouble while you were in the military?*” This sort of open-ended question will elicit far more information—including histories of sexual harassment, combat trauma, hazing, racial discrimination—than asking about only disciplinary action or incarceration. Make sure you ask the patient if he or she finished his tour of duty and if not, what happened. Never ask a patient “*Why didn’t you . . .*” It is judgmental. It is preferable to ask questions of the form “*What took place that stood in the way of your finishing your time in the Army?*” Ask about the patient’s military branch, military occupational specialty (MOS) and where the patient was stationed. Asking what prompted them to join the military can reveal much in the way of pathology in their family of origin. Do not assume that combat veterans have been properly screened for TBI; many have never undergone neuropsychological testing.

Start your review of the patient's history of head trauma with something he told you during the social history. For example, *"You mentioned when I was asking about your childhood that you'd been hit by your mom, but that she never hit you in the head. Have you had any blows to the head at all?"* If so, ask if the patient lost consciousness, how long, if he was brought to hospital, and if he received any treatment. Ask one question at a time.

If the patient did not lose consciousness, ask if he was dazed and confused after the blow. Ask about any other blows to the head, both in childhood (*"Did you ever get hit by a car while riding your bike when you were a kid?"*) and in adulthood (*"Did you ever get hit in the head with a baseball bat?"*; *"Were you ever in fights and hit in the head?"*; *"Did anything bad ever happen to you while you were in jail?"*). Ask the same array of questions for each head injury.

It is important to realize that patients may have sustained injuries in childhood about which they know nothing as a result of post-traumatic amnesia. In these instances, as well as in the case of persons suffering from marked memory deficits, it is helpful to take an inventory of scars that are visible on their heads in the course of the evaluation. Ask them to remove any hats, caps, scarves or headbands, and ask *"How did you get that scar on your head?"* Simply posing the question about scars on the patient's face, head and other areas visible to you without asking the patient to disrobe can jog a faulty memory and lead to an illuminating history.

In a similar way, asking in a kind way how a patient lost his teeth can reveal histories of head trauma (*"with a baseball bat"*) that would otherwise go unreported. If there is a history of head injury, be sure to assess for memory deficits in the mental status exam. Keep in mind that the Folstein Mini-Mental Status Exam (MMSE) may not be sensitive enough to deficits in cognitive functioning that can present obstacles to the patient succeeding in the housing process. Use of reliable instruments such as the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS™), Cognistat™ (Neurobehavioral Cognitive Status Examination) and Brain Injury Screening Questionnaire (BISQ) can assist in accurate assessment of patients with cognitive impairment or TBI, as well as form the basis for referral to neuropsychology for testing, if feasible.

Whenever possible, forming partnerships with local neuropsychologists and TBI centers, putting into place streamlined referral processes can lay the groundwork for optimal outcome.

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