

# Driving after Brain Injury: Issues, Obstacles, and Possibilities



Brain Injury Association  
of America



*This brochure  
was developed  
for persons with  
brain injury,  
family members,  
caregivers, and  
friends to suggest  
ways to deal  
with the problems  
one may face  
when living with  
brain injury.*

**Driving after Brain Injury:  
Issues, Obstacles, and Possibilities**

Carolyn Rocchio and Thomas A.  
Novack, PhD

# Contents:

- 2** Introduction
- 2** How Can Brain Injury Affect Driving Ability?
- 4** What Does Research Tell Us?
- 5** Driving Evaluation and Training
- 6** Vehicle Modifications
- 7** Legal and Insurance Considerations
- 7** Other Transportation Options
- 8** A Note to People with Brain Injury
- 10** A Note to Family Members and Caregivers
- 11** Conclusion
- 11** Organizations and Resources
- 12** About the Authors

## INTRODUCTION

People who have sustained a brain injury sometimes find that their driving skills are no longer the same. Family, friends, and caregivers may also be worried about whether a person with brain injury can drive safely. This booklet is intended to help everyone make informed decisions about whether an individual should resume driving after brain injury, and if so, when. It reviews the skills needed to drive well, the research into driving after brain injury, and the basics on driving evaluations, legal issues, transportation alternatives, and more. Lastly, it offers practical considerations that both individuals with brain injury and their families should keep in mind and a list of organizations to contact for further information.

## HOW CAN BRAIN INJURY AFFECT DRIVING ABILITY?

Because we take our driving skills for granted, it is easy to forget that driving is the most dangerous thing we do in our everyday lives. We might even think of it as the ultimate multitasking experience. Brain injury can affect the many physical, cognitive, and behavioral skills needed to drive well, depending on the individual and the type of injury. For example, the driver's physical ability to steer the vehicle and control speed, including braking, may be altered by brain injury.

Before they can decide whether or not to

get behind the wheel again, people with brain injury also need to consider their abilities in the following areas:

**Vision:** Adequate vision for driving doesn't just mean the clarity that can be provided by eyeglasses or corrective lenses. Drivers must be able to concentrate attention in their **central vision**, but they must also possess good **peripheral vision**—the ability to see things "out of the corner of your eye." Drivers also need to perceive the **spatial relationships** between the vehicle and its surroundings, such as its position in lanes of traffic. Picturing the vehicle in space allows the driver to judge distances for the purposes of changing lanes, turning, stopping, and preparing to enter or exit major highways.

**Reaction time:** A driver must see and hear many things that come from all directions and constantly decide what is important and what is not. Drivers need to process a great deal of information and react quickly in an appropriate way. They must also make sure their attention and reflexes are sharp no matter how long or short the drive.

**Judgment:** Motorists constantly make judgments, whether they're in the midst of merging into flowing traffic on a busy freeway or just deciding whether or not to drive through a heavy rainstorm. Making these types of judgment often involves weighing the driver's level of skill and confidence against the conditions at hand, which requires self-awareness and an understanding of one's own strengths and weaknesses.

## WHAT DOES RESEARCH TELL US?

Research findings vary widely on the relationship between driving skills and brain injury, and there is limited information available on the driving records of people who have sustained a brain injury. We do know that between 30 and 60 percent of people with severe brain injury return to driving after they are injured. Evidence also suggests that people with brain injury may place limitations on their driving habits. They may drive less frequently than they did before the injury or drive only at certain times (such as during daylight), on familiar routes, or when traffic is light.

Studies indicate that a failure to recognize even mild cognitive difficulties on the part of the person with brain injury may lead to increased risk while driving. Brain injury can disrupt and slow down skills that are essential to good driving, such as:

- Ability to maintain a constant position in a lane
- Accuracy of visual perception and memory
- Visual problem solving
- Hand-eye coordination
- Reaction time

Recent research also shows that people with brain injury can experience difficulties in understanding visual stimuli presented rapidly on the periphery of their vision, a problem that is related to driving performance. But there is reason to hope that driving skills affected by brain injury can be improved through training that

focuses on visual scanning, spatial perception, attention skills, and problem solving.

For a summary of the findings of numerous research studies on driving after brain injury and a detailed reference list, go to BIAA's Web site at [www.biausa.org](http://www.biausa.org).

## **DRIVING EVALUATION AND TRAINING**

A driving evaluation is a crucial step in determining a person's ability to drive following recovery from brain injury. An individual may be referred for an evaluation and/or training through an inpatient rehabilitation program, a state-supported TBI program or trust fund, a private vocational counselor, or the Department of Veterans Affairs. In some cases, the program or organization making the referral can also cover the cost of the evaluation and any training that follows.

Often, it is up to the individual, family members, or other caregivers to ask for a driving evaluation referral. If the medical professionals attending to the person with brain injury don't suggest a evaluation, family members may assume that the person can drive safely, but this may not be true. (It is also wise for the person with brain injury to undergo an evaluation before riding a bicycle or motorcycle.)

Evaluation and training are often provided by professionals certified through the Association for Driver Rehabilitation Specialists (ADED). A list of certified

professionals may be found on the ADED Web site, [www.driver-ed.org](http://www.driver-ed.org). A typical driving evaluation is in two parts:

1. A review of cognitive abilities, including reaction time, judgment, reasoning, and visual spatial skills.
2. A test of the mechanical operation of a vehicle, either using a simulator or on a live roadway in the presence of the evaluator.

Some individuals with minimal cognitive deficits are able to become certified to resume driving after they have had training in areas such as visual scanning, attention, and concentration.

## VEHICLE MODIFICATIONS

If an individual with brain injury has physical disabilities but has well-preserved cognitive functions, the individual may be able to resume driving with certain modifications to the vehicle, such as hand controls and lifts for entering and exiting. Standard modifications for most passenger cars cost approximately \$1,000. More extensive modifications, or alterations made to vans or trucks, can cost several times more. Payment for modifications may be made by private insurance, Vocational Rehabilitation, Worker's Compensation, the Department of Veterans Affairs, or brain-injury trust funds in some states. Frequently, community fundraising events are held to defray these costs.

Ask a certified driving evaluator for local tips about companies that provide modifications. Or look in the yellow pages

or on the Internet using keywords such as "rehabilitation," "medical equipment," and "auto modifications."

## **LEGAL AND INSURANCE CONSIDERATIONS**

Each state establishes its own rules and regulations on driving, and the laws about when a license can be taken away from a driver vary widely from state to state. Some states require physicians to report to the authorized state licensing agency if they have a patient for whom driving may no longer be safe. Other states require licensed drivers to report any change in medical status before they resume driving.

It is important for individuals and their families to know and follow the laws governing the operation of motor vehicles. It is also important for them to learn the language of their insurance policies, as some policies may limit liability if certain requirements are not met following a vehicular crash involving injury.

## **OTHER TRANSPORTATION OPTIONS**

In the event that an individual can no longer operate a vehicle safely, it is important to locate other transportation options, perhaps by reaching out to family members, friends, or colleagues. Buses, trains, and subway systems may be an option, too. Public transportation can pose challenges, however, for people with cognitive impairments that cause difficulty

with memory, money management, awareness of time and place, and appropriate social skills. Rehabilitation specialists can often help individuals with brain injury compensate for these difficulties through training.

States have agencies that are responsible for making sure that people with disabilities—particularly those living in large metropolitan areas—have transportation options, which can include accessible vans, buses, and even payment for taxi service. Many local bus companies coordinate para-transit services.

If you are unable to locate community transportation options through your local transit company, contact the Brain Injury Association affiliate or Center for Independent Living in your state for further assistance.

## **A NOTE TO PEOPLE WITH BRAIN INJURY**

Wanting to drive after a brain injury is natural, and a return to driving may be an important goal for you. But you can't assume that you will achieve this goal; all you can ask for is a fair assessment of your abilities. If your doctors and therapists conclude that driving would be dangerous, it is important to accept their judgment. Not being able to drive is a hassle, but remember that safety is the most important issue—not just your safety, but the safety of other people on the road.

If you are cleared to drive again, remember

that passing a driving test doesn't necessarily mean that you'll be the same driver you were before your injury. You may want to rule out driving at night or in heavy traffic, and you may want to consider other transportation options for long trips.

Consult with your physician and rehabilitation professionals on what is best for you. Ask your pharmacist if any of your medications may impair your ability to drive. Eliminate distractions while driving—turn off your radio and leave your cell phone off.

Keep in mind, too, that the same cognitive skills required for driving can also affect the safe operation of bicycles, motorized scooters, and other recreational equipment, putting you and others at risk for another brain injury. To test these skills, experiment in a safe area such as a park, and use safety equipment such as knee and elbow pads and a helmet.



## A NOTE TO FAMILY MEMBERS AND CAREGIVERS

In a 2006 study, the perceptions of close relatives about an individual's fitness to drive were the strongest predictors of whether or not a person with brain injury would return to driving—even surpassing neuropsychological test results. It is clear that family members and other caregivers can have great insight into the physical, cognitive, and behavioral impact of brain injury. Often, though, they are also in a tough position when the subject of driving arises.

If the person receives inpatient rehabilitation, be sure to ask if there is a reasonable expectation that recovery will support driving at some future date. Ask if you should schedule a driving evaluation and where to obtain a referral. The answers to your questions will help prepare you to address the issue as recovery continues.

Driving is an important part of a person's independent lifestyle. The person with brain injury may assume that he can return to driving once he recovers physically—and well-meaning families may support this assumption—but it may not necessarily be the case. Since it may be very difficult for families to inform their loved ones that they are not permitted to drive, they may want to leave the discussion up to the medical team. With time and further recovery, the individual often gains greater insight into his abilities and limitations, and may come to agree that driving is not a safe option.

## CONCLUSION

The course of recovery after brain injury can be very unpredictable. It is often difficult to plan for the future and remain realistic about just how much independence a person can regain. If and when a person may safely return to driving is one of those unknowns that should be addressed early in recovery, with the individual, family, and treating professionals included in the decision-making process.

## ORGANIZATIONS AND RESOURCES

Brain Injury Association of America  
National Brain Injury Information Center  
1-800-444-6443  
[www.biausa.org](http://www.biausa.org)

U.S. Department of Veterans Affairs  
[www.va.gov](http://www.va.gov)

Centers for Independent Living  
[www.ilru.org/html/publications/directory/index.html](http://www.ilru.org/html/publications/directory/index.html)

State Vocational Rehabilitation Offices  
[www.jan.wvu.edu/SBSES/VOCREHAB.HTM](http://www.jan.wvu.edu/SBSES/VOCREHAB.HTM)

International Center for Disability  
Resources on the Internet  
[www.icdri.org](http://www.icdri.org)

Association for Driver Rehabilitation  
Specialists (ADED)  
[www.driver-ed.org](http://www.driver-ed.org)

National Mobility Equipment Dealers  
Association  
[www.nmeda.org](http://www.nmeda.org)

## ABOUT THE AUTHORS

### **Carolyn Rocchio**

Ms. Rocchio is a nationally recognized advocate, author, and speaker in the field of brain injury. Her expertise in brain injury developed as a result of a 1982 auto crash in which her son sustained a severe traumatic brain injury. She is the author of *Ketchup on the Baseboard*, as well as numerous monographs and book chapters. She is the Founder of the Brain Injury Association of Florida, member of the TBI Technical Assistance Center Steering Committee, and past member of the TBI Standards Advisory Committee for CARF and the Executive Committee of the Brain Injury Association of America. Ms. Rocchio has been the recipient of numerous honors and awards, including the James H. Bruce Lifetime Achievement Award from the Florida Department of Health; the Jim and Sarah Brady Award for Public Service; and the Association of Trial Lawyers of America Civil Justice Foundation Community Champion Award.

### **Thomas A. Novack, PhD**

Dr. Novack is a Professor of Physical Medicine & Rehabilitation at the University of Alabama at Birmingham. He received his PhD in Clinical Psychology from Memphis State University. He has practiced neuropsychology at the Spain Rehabilitation Center since 1985 with an emphasis on assessment and treatment of people experiencing traumatic brain injury.

## Notes

---

---

---

---

---

---

---

---

---

---



**Medtronic**

This booklet was supported through an unrestricted educational grant from the Medtronic Foundation. Its contents are solely the responsibility of the author and do not necessarily represent the official views of the Medtronic Foundation.

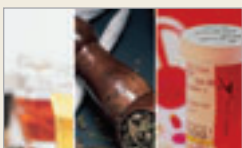
*Driving After Brain Injury: Issues, Obstacles, and Possibilities* is one in a series of brochures on "Living with Brain Injury."



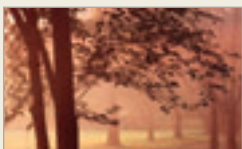
*Preparing for Life after High School*



*A Basic Legal Glossary*



*Substance Abuse*



*Depression*



*Falls and Traumatic Brain Injury*



*A Physician Talks About Severe Brain Injury*

To order any of these booklets, please contact the Brain Injury Association of America at

**1.800.444.6443 or  
[www.biausa.org](http://www.biausa.org)**