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Understanding Brain Injury

A Guide for Employers

Thousands of people with brain injury enter the workforce each year. As an employer, you have an opportunity to assist in the vocational success of individuals with brain injury.

"Understanding Brain Injury" explains the causes and types of brain injury. It lists the behavioral changes that are most common among people who sustain brain injuries, and offers simple techniques you can use to help them deal with the possible changes. The effort you put forth can make a tremendous difference to an employee with a brain injury.

Introduction

Returning to work is a goal that drives most survivors of brain injury through the long and difficult rehabilitation process. Yet when they finally achieve this goal, often they have difficulty adjusting to expectations of the workplace.

Brain injury is a life-altering event which affects virtually every area of a person's life — including work. Oftentimes, simple adjustments in the work environment are all that are necessary to help the person with a brain injury be successful on the job.

As an employer, you are required by the Americans with Disabilities Act to provide reasonable accommodations to help any employee with a disability achieve vocational success. A job accommodation is an adjustment or modification of a job, the job site, or the manner of performing a job. It may help a person with disabilities to better perform essential job functions, increase productivity, or be independent in completing tasks. This can be a very simple and inexpensive process.

An example of an accommodation for a worker with a brain injury could be providing the person with a notebook in which to write down important information to compensate for memory deficits.

To assist you in the job accommodation process, we have provided you with information about many aspects of brain injury. This brochure contains information on the following topics:

- The structure and function of the human brain
- The causes of brain injury
- The recovery process
- Physical, behavior and communication changes after brain injury

Identifying accommodations and implementing workplace modifications can be challenging. The **Vocational Case Coordinator** employed at the Mayo Brain Rehabilitation Program is available to assist you with this process, and provide additional information about brain injury. The Vocational Case Coordinator may be reached at 507-255-3116.

Structure and Function of the Human Brain

The human brain is composed of billions of nerve cells. These are arranged in patterns that work together to control thought, emotion, behavior, movement and sensation. In order to understand this more clearly, it is useful to know something about the brain's structure and function.

The brain is divided into two halves that look nearly the same but differ in many functions. These are the **cerebral hemispheres** (see Figure 1). The cerebral hemispheres are further divided into four separate areas called **lobes.**

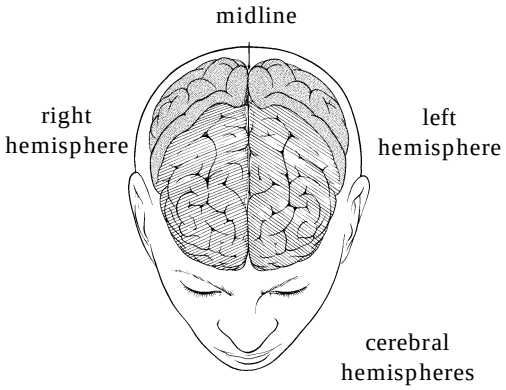

Figure 1

For most people, the left half of the brain controls verbal functions including language, thought and memory involving words. The right half controls nonverbal functions. These include such things as recognizing the differences in visual patterns and designs, reading maps and enjoying music. The right hemisphere also is involved in the expression and understanding of emotions.

Although each half of the brain has distinct functions, the two parts actually work closely together in a very special way to control the activity of the body. The left side of the brain controls the right side of the body, and the right side of the brain controls the left side of the body. Thus, damage to the right side of the brain may cause movement problems or weakness on the left side of the body.

Specific parts of the brain control specific functions. The effect of a brain injury is partially determined by the location of the injury (see Figure 2).

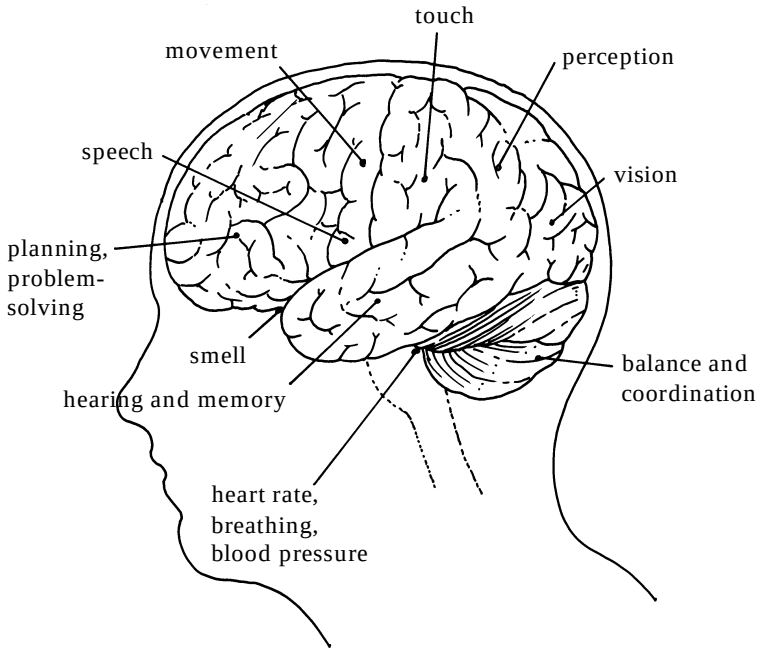

Figure 2

Types and Causes of Brain Injury

What causes a traumatic brain injury?

When an outside force strikes the head, there may be damage to the brain and to the skull that protects it. This outside force could be a blow to the head caused by an automobile accident or a fall. The initial response to this trauma may vary. The injured person may feel slightly dazed or may lose consciousness for several minutes, hours or even days. The strength of the outside force is important in determining how serious the injury to the skull and brain is.

The direction of the outside force also is important in determining the extent of brain injury. When the head is struck from the front, back or sides, the brain is quickly thrust forward and then again backward against the inside of the skull. This can cause localized brain damage in the area of the initial impact, on the opposite side of the skull, or in both places. There may be bleeding at both sites. This type of injury is called a **coup-contrecoup** injury (see Figure 3).

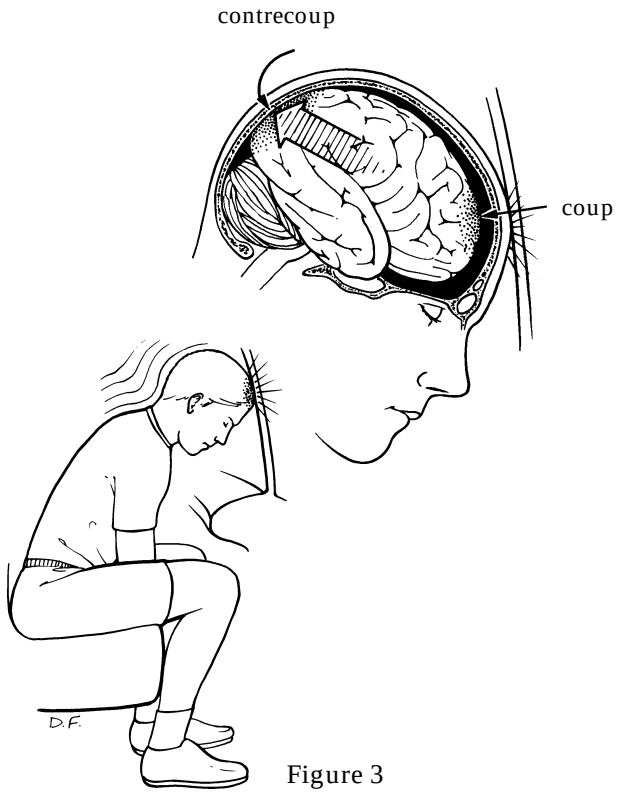

Figure 3

Localized brain injury also can be caused by a fracture of the skull, or when an object enters the head and damages brain tissue in its path.

When the head is struck at an angle and rotates, nerve cells in many areas of the brain can be stretched simultaneously, leading to damage that is much more widespread. This is known as **diffuse axonal injury**. Diffuse axonal injury can occur without fracture or penetration of the skull.

Traumatic brain injury can result in a combination of both localized and diffuse damage to the brain.

What are other causes of brain injury?

Not all brain injuries are a result of outside forces. Sometimes a change in flow of blood within the brain can cause brain damage. A blocked or burst blood vessel or lack of oxygen to the brain can damage brain cells. Swelling of brain tissue after such an occurrence can result in further damage. Strokes, aneurysms and tumors are examples of other causes of brain injury.

Process of Brain Injury Recovery

Recovery may be measured in weeks, months and years and slows with the passage of time. The effects of brain injury often are long lasting and recovery may be incomplete. Although some people with severe brain injuries experience only mild long-term difficulties, other people may require care or special services for the rest of their lives.

In the days and weeks immediately following brain injury, the function of surviving brain tissue often is affected by swelling, bleeding and/or changes in the complex chemistry of the brain. Sometimes blood accumulation must be removed surgically to reduce swelling and pressure within the brain. Controlling swelling and giving the blood flow and chemical systems of the brain time to recover usually lead to improvement in function.

It is not clear exactly what happens in the brain during the later stages of recovery, but some parts of the recovery process are slowly beginning to be understood. Recovery from brain injury does not mean replacement of destroyed brain tissue. There is no known way for the brain to create new cells. However, many things can occur to help restore surviving brain tissue to its best possible function. For example, though the total number of brain cells does not change, it is thought that surviving brain tissue has the capacity gradually to learn how to carry on some of the functions of destroyed cells.

In cases of brain injury, there is often trauma to other parts of the body with associated bleeding, swelling and changes in function. The effects of these other injuries can further damage the brain. For instance, excessive bleeding may deprive the brain of needed blood and oxygen. Prompt treatment for associated injuries may help limit damage to the brain.

The medical community has just begun to appreciate the mechanisms by which a damaged brain recovers. Current treatment methods are based on a growing understanding of these mechanisms.

A Partnership Approach

Problems of thinking and behavior can emerge as a result of brain injury. It is important to recognize and understand that the source of these problems is the injury to specific parts of the brain. The following information outlines thinking and behavioral management strategies that may help the person with brain injury compensate for the loss of certain skills.

After a person has experienced brain injury, he or she may feel a loss of control in many aspects of life. This person may feel inferior or unequal in work situations. When working with a person with a brain injury, it is important to emphasize a partnership approach to negotiating thinking and behavior problems. This means acting as partners in the decision-making process by working together to determine how to solve a problem. You can work together as partners by following these steps:

1. Prepare a plan of action

- Involve the person with brain injury in planning.
- Define responsibilities.
- Use compensation tools such as calendars and notebooks through the planning phase.

2. Keep it simple

- Break the task into small steps.
- Keep the environment free of distractions.

3. Use a problem solving format

- Recognize that there is a problem.
- Define the problem.
- Decide on possible solutions to the problem.
- Weigh the advantages and disadvantages of each possible solution.
- Pick a solution.
- Try the solution.
- Evaluate the success of the solution.
- Try another solution if the first one is not working.

4. Maintain open communication

- Discuss performance and job expectations.
- Evaluate performance and provide gentle, realistic comments about behavior.
- Identify successes and address areas of concern or problems directly, without delay.

Behavior, Memory and Thinking Problems After Brain Injury

Brain injury can disturb:
- Alertness and concentration
- Self-awareness
- Perception
- Memory and learning
- Reasoning, planning and problem-solving
- Speech and language
- Motor control
- Emotions

The following information will help familiarize you with behavior, memory and thinking problems that a person with brain injury may experience. Also included are specific techniques you can use to help the person participate more effectively and comfortably in the work environment. Consistent and frequent repetition of the specific techniques listed will increase the chance of success.

Please do not hesitate to contact the **Vocational Case Coordinator** if you have questions or need assistance and suggestions.

Confusion

Signs
- Confuses times / tasks in schedule of activities
- Confuses past and present events
- Confabulates (makes up convincing stories to fill memory gaps; this is not intentional lying)

What to do
- Encourage the use of a notebook to log events and encourage the person to refer to it for details of daily events.
- Gently remind the person of correct details of past and present events.
- Confirm accurate information with other people.
- Arrange for consistency in routine tasks (use calendar and notebook).
- Limit changes in daily routine.
- Provide detailed explanations of even the most basic changes in policies or procedures.

Difficulty remembering

Signs

- Unable to remember tasks from day to day
- Unable to remember new information

What to do

- Establish a structured routine of daily tasks.
- Encourage the consistent use of memory aids such as calculators and notebooks to plan, record and check-off tasks as completed.
- Encourage the person to write down new information in the memory notebook.
- Encourage other co-workers also to write down any information they may need to provide the other person.
- Encourage review and rehearsal of memory notebook information frequently throughout the day.
- Provide opportunities for repeated practice of new information.
- Try to pair new information with things the person is able to recall.
- Provide spoken cues as needed for recall and, if necessary, help fill in memory gaps.

Attention problems

Signs

- Short attention span
- Distractibility
- Difficulty in attending to one or more things at one time

What to do

- Focus on one task at a time.
- Be sure you have the person's attention before beginning a discussion or task.
- Decrease distractions when working with the person (turn off noises).
- Praise any improvement in length of attention to activity.
- Gently refocus the person's attention to the details of activity as needed.
- Keep abrupt changes to a minimum.
- Ask the person to repeat information they've just heard to be sure they followed a conversation.
- Schedule brief rest periods in between short periods of work or activity (for example, 20-30 minutes working, 5 minute break, 20-30 minutes working, etc.).

Difficulty with decision making — poor judgment

Signs

- Hesitation with decisions
- Inappropriate and potentially harmful decisions
- Difficulty reasoning
- Ineffective problem solving

What to do

- Encourage the person to "stop and think." Many people with brain injury benefit from a note or a stop sign on the front of their notebook reminding them to "stop and think."
- Help the person explore various options to problems.
- Have the person write down possible options in his or her notebook.
- Discuss advantages / disadvantages of each option.
- Role play to prepare the person for various situations.

Difficulty with initiation

Signs

- Has trouble getting started
- Appears disinterested or unmotivated

What to do

- Help the person develop a structured daily routine.
- Provide specific choices for daily tasks. For example, ask "Would you like to do A or B?"
- Simplify tasks. Break down tasks into simple steps and complete one step at a time.
- Encourage the use of a notebook or calendar and set specific deadlines for tasks to be completed.
- Praise the individual when he or she gets started without assistance.
- Establish time frame in which to accomplish tasks.

Difficulty carrying out a plan of action

Signs

- Lack of follow-through with a task
- Difficulty in planning a sequence of tasks
- Appears disorganized

What to do

- Begin with small, realistic projects.
- Include the person in planning the activity.
- Provide a clear and detailed explanation of an activity before starting.
- Break down new or complex tasks into several easier steps.
- Have the person write down the sequence of steps for the task.
- Ask the person to repeat to you the task to be done to ensure understanding.
- Encourage the person to refer to his or her plan, and check off each step and task as it is completed.
- Repeat and explain the sequence of activities as needed.
- Allow extra time for the person to complete tasks.

Difficulty with self-control — impulsivity or lack of inhibition

Signs

- Acts or speaks without all the information or without considering the consequences
- Inpulsiveness or poor judgement
- Inappropriate comments to or about others
- Gets stuck on one idea

What to do

- Limit options from which the person can choose.
- Suggest alternatives for behavior.
- Explain the reasons for tasks.
- Be fair in your expectations.
- Respond immediately to inappropriate ideas but maintain the original focus of the discussion.
- Encourage the person to slow down and think through tasks or responses.
- Provide verbal and non-verbal feedback in a supportive way for reassurance.
- If undesired behavior occurs, discuss the consequences privately in a calm and confident manner.
- Praise and reward desired behavior.

Impaired self-awareness

Signs

- Lack of awareness of deficits and limitations
- Inaccurate self-image / self-perception

What to do

- Anticipate lack of insight.
- Prompt accurate self-statements.
- Use feedback generously in a positive way.
- Give realistic feedback as you observe behavior.

Difficulty with social situations

Signs

- Acting or speaking without all of the information or without considering the consequences
- Difficulty taking turns
- Socially inappropriate behavior or comments
- Not always sensitive to social boundaries

What to do

- Provide clear expectations for desirable behavior.
- Treat the person appropriately for his or her age.
- Plan and rehearse social interactions so they will be familiar, predictable and consistent.
- Establish verbal and non-verbal cues to signal the person to “stop and think.”
- Encourage the person to slow down and think through responses.
- Prompt the person to consider the consequences of his or her behavior.
- Provide positive feedback for appropriate behavior.
- Encourage a break in activity when frustration is evident.
- Respond immediately to inappropriate ideas but maintain the original focus of the discussion.
- If undesired behavior occurs, address the behavior and consequences privately, in a calm and confident manner. Be objective and explain that the behavior, not the person, is inappropriate.
- Reassure and be fair in your expectations.

Difficulty controlling emotions

Signs

- Mood swings ranging from anxious to sad to angry
- Inappropriate laughing or crying
- Lower tolerance for frustrating situations

What to do

- Expect the unexpected.
- Remain a model of calm assurance and confidence if an emotional outburst occurs.
- Take the person to a quiet room or area to give him or her time to calm down and regain control.
- Provide feedback in a gentle supportive manner after the individual regains control.
- Avoid comparing past behaviors to present.
- Gently redirect behavior to a different topic or activity.
- Use humor in a positive and supportive manner.
- Recognize that the person may use negative comments or refusal as a means of control.
- Understand that brain injury often prevents the individual from feeling guilt or empathy.
- Recognize your own emotional reactions to the person with brain injury.

Communication Changes After Brain Injury

A brain injury can affect the way a person communicates. Difficulties with communication can be caused by many different factors, including changes in behavior and thinking skills, problem-solving, judgment, reasoning, awareness, memory loss and self-awareness.

Language ability and speech may also be affected by brain injury. Through language, a person receives and expresses ideas. Language is linked to cognition (thinking ability) and involves understanding, talking, reading and writing.

People with brain injury may have changes in one or many of these areas. These changes will affect the way the person with brain injury communicates. The severity and combination of problems vary from one person to the next.

Initiating conversation

Signs

- Does not respond to another person's conversation, questions or comments
- Does not start, or is slow to start conversations, ask questions, or make comments
- Leaves long pauses
- Has difficulty explaining what he or she means

What to do

- Encourage the individual to participate. For example, ask, "What do you think about that?"
- Ask open-ended questions such as, "Tell me about _____."
- Give the person time to organize his or her thoughts. He or she may need extra time in order to respond to any reques t or question.
- Give the individual your full attention and allow time for him or her to complete the thought.
- Rephrase what the person has said, such as, "Do you mean _____?"

Following conversation

Signs

- Has difficulty paying attention to what is said
- Misinterprets what is said

What to do

- Get the person's attention before speaking.
- Be clear and concise.
- Reduce distractions.
- Emphasize important information.
- Offer to repeat what was said.
- Ask him or her to look at you when speaking.
- Invite the person to ask questions if he or she does not understand.

Taking turns in conversation

Signs

- Talks non-stop, does not give the listener a turn to speak
- Does not appear to adjust communication style or behavior for the situation

What to do

- Politely interrupt and ask the person for a chance to speak.
- Ask the person to, "Please make it brief," or tell him or her you would like to say something.

Dealing with topics

Signs

- Has a hard time selecting topics for conversation
- Has a hard time keeping up when topics change
- Introduces a new topic abruptly
- Does not always stay on topic

What to do

- Ask about the person's interests and opinions.
- Clarify new topics as they come up.
- Ask how his or her comment relates to the topic. ("Do you mean _____?")
- Tell the person you are confused or "getting lost" in the conversation.

Intelligibility

Signs

- Slurred speech
- Speaks too loudly or softly, making it hard to understand his or her message
- Speaks too rapidly

What to do

- Tell the person you did not understand and ask him or her to repeat.
- Establish and use consistent gestures or cues. For example, cup your hand to your ear as a reminder to speak louder.

Non-verbal communication

Signs

- Does not seem to understand common non-verbal cues
- Stands too close or too far from conversational partner(s)
- Uncomfortable number / type of physical contacts
- Body language that does not seem to "match" what is said
- Facial expressions that do not seem to "match" what is said
- Distracting, repetitive or excessive body movements
- Poor eye contact
- Staring at others during conversation

What to do

- Ask the person to maintain a comfortable distance.
- Politely ask the individual to modify his or her physical contacts and explain that the physical contacts make you feel uncomfortable.
- Tell the person you are confused by the difference in body language and spoken message.
- Ask the person what he or she is feeling.
- Politely ask the individual to stop his or her distracting movements.

Impact of Fatigue After Brain Injury

How does fatigue impact employment?

An often-overlooked element of recovery from brain injury is fatigue. Fatigue may result from brain injury itself and other injuries associated with brain injury. Because activities that once were performed with little or no effort may now require great amounts of energy, a person with brain injury may experience an overwhelming sense of tiredness. This fatigue may directly impact work performance by making physical functioning, attention, concentration, memory and communication more difficult.

When a person with brain injury returns to work, it is difficult to know how much he or she should do and for how long. Many individuals return to work with little understanding of how their brain injury will affect work performance. They may try to return to work too quickly and take on too much responsibility too soon. When this happens, despite his or her dedicated effort, the person's attempt may prove unsuccessful. In order to provide the greatest chance for success, many employees return to their former positions with medical restrictions. Restrictions are given to reduce fatigue and improve the chances for a successful return to work. These restrictions may include a temporary reduction in working hours and workload. Often restrictions are accompanied by guidelines for gradually increasing work hours and responsibilities.

In time, a person's stamina and energy level likely will improve and work hours and responsibilities may be increased. However, often during this transitional time, employers and employees become frustrated with the gradual pace and shifts in responsibility. It is important to remember that this is just one step in the recovery process for a person with brain injury. A supportive work environment with open communication between employee and supervisor will go a long way to promote healthy gains in performance and reduce employment setbacks.

Interpreting medical restrictions

Interpreting medical restrictions and guidelines can be confusing. Mayo Clinic's **Vocational Case Coordinator** is available at 507-255-3116 to discuss these guidelines with you and to assist in the development of a vocational plan for an individual returning to work after a brain injury.

Seizures After Brain Injury

A medical condition that may occur after brain injury is post-traumatic epilepsy (seizures). Seizures can be caused by a sudden, excessive, disorderly electrical discharge of brain cell activity.

The risk of ongoing seizures is related to the severity and characteristics of the injury. The risk seems to be greatest in the first two years after injury, then gradually declines. Up to 10 percent of people with traumatic brain injury have ongoing seizures.

There are two types of seizures that may occur after brain injury. These are generalized (grand mal, tonic/clonic) and partial (partial complex and simple partial) seizures.

Generalized seizures

Grand mal, tonic/clonic seizures usually involve involuntary jerking or shaking of most or all four limbs, unresponsiveness and loss of bladder control.

Most seizures are self-limited and last only a few minutes. The person may cry out, stiffen and fall, have jerking movements, turn flushed or blue and have some difficulty breathing. Try to remain calm and take the following steps:

1. Make sure the person is in a safe area and put something soft under the head if the person has fallen down.
2. Loosen tight clothing such as a necktie or belt and remove glasses.
3. Clear away hazardous objects that may be nearby.
4. Place the person on his or her side keeping the chin away from the chest. This will allow drainage of saliva from the mouth.
5. Do not force your fingers or any object into the person's mouth.
6. **Do not restrain the person. You cannot stop the seizure.**

After the seizure, the person usually will be temporarily confused and drowsy. Do not offer any food, drink or medication until he or she is fully awake. Someone should stay with the person until he or she has fully recovered. Check for a medical identification tag on a bracelet or necklace.

Dial 911 for emergency assistance in the following situations:
1. Breathing does not resume after the seizure and mouth-to-mouth resuscitation is necessary.
2. The recovery after the first seizure is not complete and another seizure begins.
3. The person has been injured during the seizure.
4. The person has awakened and requests an ambulance for emergency medical attention.
5. The seizure continues for more than five minutes without stopping.

Prompt medical care also is recommended with an individual's first known seizure.

Until a set seizure-free interval has been maintained (often six months to one year), driving privileges are restricted by state law. During this time, extreme caution should be taken if the employee will be working around heavy or dangerous equipment.

Partial seizures

Partial complex seizures may involve loss of awareness, inappropriate verbal response, purposeless movement, staring or repetitive chewing, swallowing or lip-smacking motions.

Simple partial seizures are an involuntary jerking or shaking of one part of the body without loss of consciousness. These may spread to other body parts and become generalized.

Take the following steps in this situation:
1. Do not try to restrain the person unless his or her safety is in jeopardy.
2. Try to remove hazardous or harmful objects that may be nearby.
3. Arrange for someone to watch the person until he or she is fully aware again.

Medical assistance generally is not necessary when partial seizures occur except when one seizure follows another in a continuous series, or when a partial seizure develops into a generalized seizure and the person is not recovering.

Driving After Brain Injury

A person with a brain injury may have physical, thinking and/or vision impairments, or have seizures that make driving unsafe. For this reason, the privilege of driving may be denied. Some states require that the physician notify the Department of Public Safety of the reasons it is unsafe for the person to drive. Other states rely on the physician to help patients come to their own decisions about driving.

If the person with brain injury is cleared by his or her physician to drive, the individual's driver's license held before the injury continues to be valid and no special applications need to be made. If the driver's license is revoked, the person must pass the written and practical driving tests, and a physician must grant a medical clearance before a new license is issued.

People with brain injury are responsible for their decision to drive and for any consequences that may result.

In addition, the same problems that make driving unsafe also can make other activities unsafe for individuals with brain injury. An example of another potentially unsafe activity is operating power equipment.

Summary

Work plays a major role in the lives of most people. Work is one important way we define ourselves. It provides a sense of accomplishment, achievement, recognition, independence and meaning to our lives. This also is true for individuals with brain injury. Often, persons with brain injury experience changes in behavior, emotions and thinking that can make returning to a work environment frustrating and difficult. As an employer, your willingness to adjust and accommodate work situations will help to create a positive environment. This may serve to provide a more efficient and productive work experience.

The **Vocational Case Coordinator** employed by the Brain Rehabilitation Program can assist you with possible concerns or questions you may have about brain injury and return to work issues. Please do not hesitate to contact the **Vocational Case Coordinator** at 507-255-3116 for assistance.

Notes

Notes

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