

# Cognitive Changes

## What are cognitive changes?

Cognitive changes are problems with thinking, including memory, concentration and behavior. These changes can influence many parts of your life, such as your ability to work or even to complete everyday tasks. Some cancers, cancer treatments and medications can cause cognitive changes for cancer survivors. However, there are many other causes of cognitive changes that are not related to cancer.

Experiencing problems with thinking and concentration can be very scary. It can be very upsetting to realize that you have successfully treated your cancer but are now experiencing cognitive problems as a result of the cancer, its treatment or some other cause. Just because you had chemotherapy, radiation or surgery does not mean that you will definitely have cognitive changes. But it is important to know what the symptoms are so that you know what to look for.

If you do notice problems with thinking, memory or behavior, talk to your health care team right away. To get the correct treatment, it is important to find out what is causing the cognitive problems.

Sometimes the cognitive changes that are related to cancer are very minor and are reversible, meaning the changes will go away. Some cognitive changes can be more noticeable, however, and may not be reversible. Cognitive changes can happen suddenly (acute onset), or they can come up slowly over time (gradual onset).

## Who is at risk for cognitive changes?

Survivors who experienced the following might be more at risk for cognitive changes:

- Central nervous system (CNS) involvement with tumor
- Treatments administered directly to the CNS
- Treatments administered when extremely ill
- Chemotherapy and radiation given to the brain at the same time
- Chemotherapy given into the spinal fluid after radiation

Cancer survivors who did not experience any of the above procedures may still experience some cognitive changes. Cognitive changes can occur in survivors of all ages who received all types of chemotherapy and radiation. Those who had surgery to remove a brain tumor can also experience cognitive changes. The frequency and severity of cognitive changes associated with chemotherapy varies with the dose and type of medicine used. Cognitive changes are sometimes related to higher dose treatment of chemotherapy and the use of immunotherapy, treatment to boost the immune system. The frequency and severity of cognitive changes associated with radiation and surgery to

remove a brain tumor depends on the amount of damage caused to surrounding healthy tissue.

## **What are some of the symptoms of cognitive changes?**

### **Acute onset cognitive changes (delirium)**

Acute onset cognitive changes are those that occur suddenly and come and go with no real pattern, often during treatment with chemotherapy agents. Delirium is the term used to describe these cognitive changes. Certain medications and chemotherapy treatments can cause delirium, and it may be reversible.

Symptoms of delirium may include:

- Difficulty concentrating
- Reduced level of consciousness (person seems “out of it”)
- Person does not understand what is going on around him or her
- Unusual sleep patterns (awake at night, asleep during the day)
- Agitation
- Confusion
- Memory loss
- Loud, aggressive behavior
- Hallucinations (seeing things that aren't really there)
- Disorientation (person doesn't know where s/he is)
- Quiet, inactive behavior (including sedation and confusion)

### **Gradual onset cognitive changes (dementia)**

Gradual onset cognitive changes are considered to be chronic, meaning they come about slowly over time and are long-lasting. Dementia is the term used to describe these cognitive changes. Symptoms of dementia might not appear until you finish active treatment for cancer. Dementia symptoms can be very mild and only slightly noticeable, or they can be very noticeable.

Symptoms of dementia may include:

- Poor short-term memory
- Poor long-term memory
- Difficulty with abstract thinking (adding numbers together)
- Poor judgment (makes unsafe decisions)
- Changes in personality (may become moody or upset without a noticeable cause)
- Difficulty with problem solving and following directions
- Disorientation (person doesn't know where s/he is)

### **Chemo-brain (mild dementia)**

Sometimes survivors experience slight changes in their ability to remember or concentrate well after they have received chemotherapy. This very mild form of dementia is sometimes called “chemo-brain.”

Symptoms of “chemo brain” may include:

- Difficulty concentrating
- Difficulty remembering things that occurred recently
- Difficulty completing tasks
- Confusion
- Inability to think clearly

### **What causes cognitive changes in cancer survivors?**

Cancer cells in the brain (a tumor) destroy healthy cells and can cause cognitive changes. Chemotherapy, radiation and surgery are used to remove or destroy cancer cells, but these treatments can also damage the surrounding healthy cells. Depending on how much damage occurs, there could be noticeable problems with thinking, memory and behavior. Additionally, chemotherapy can cause factors like fatigue and anemia, which may also lead to cognitive problems, particularly with being able to pay attention.

Also, a survivor can experience other conditions that may or may not be related to cancer or its treatment that can cause cognitive changes. Some of these conditions are reversible; some are not.

Some other conditions that can cause cognitive changes:

- Medication problems
- Stress
- Anxiety
- Depression
- Electrolyte derangements
- Hypoxemia (low oxygen levels)
- Other diseases of the brain (Alzheimer's disease and Parkinson's disease for example)
- Thyroid problems
- Severe nutrition problems

It is important to discuss with your health care team all of the possible causes of cognitive problems so that you receive the correct diagnosis and treatment.

## **When do cognitive changes occur?**

Cognitive changes can occur at any point during your experience with cancer. Sometimes cognitive changes are the first sign of a brain tumor. Cognitive changes may also occur after completing cancer treatment or after taking certain medications.

Delirium may occur suddenly during treatment. Delirium usually occurs after an identified cause (chemotherapy for example) and is often reversible.

Dementia occurs gradually over time and usually occurs after treatment is completed. Dementia may be harder to identify than delirium, and may not have one identifiable cause. It can develop as early as three months after radiotherapy, but can also occur 48 months or longer after completion of radiation therapy to the brain. “Chemo brain” can occur during chemotherapy treatment or after the treatment has been completed. Dementia symptoms may also occur after surgery to remove a brain tumor.

## **Can cognitive changes be cured?**

Whether cognitive changes will improve or be permanent depends on their cause. Acute cognitive changes (delirium) that occur because of certain medicines often improve when you stop taking the medicine. Chronic changes (dementia) are often not reversible, but may be improved if the cause of the problems can be corrected.

If you notice changes in your thinking, memory or behavior, keep a record of the problems that you have and ask your family or friends to watch for additional problems. Make an appointment to talk to your health care team about these symptoms as soon as possible. Treating the underlying condition often reduces or removes cognitive problems.

## **What are some suggestions for survivors who may be experiencing cognitive changes?**

- Use the Cancer Survivor's Health Journal to communicate symptoms and side effects of medicine with your health care team
- Take the medication your health care team prescribes to help cognitive changes as directed
- Avoid dangerous activities if you are alone
- Ask your family to watch for safety issues
- Talk to your family and an attorney about legal documents you may need to make sure your medical and financial wishes are respected
- Get plenty of sleep

## Resources

National Coalition for Cancer Survivorship (NCCS)

[www.canceradvocacy.org](http://www.canceradvocacy.org) <<http://www.canceradvocacy.org/>>

Email: [info@canceradvocacy.org](mailto:info@canceradvocacy.org) <<mailto:info@canceradvocacy.org>>

Phone: 1-877-NCCS-YES (1-877-622-7937) An information specialist is available from 8:30 a.m. to 5:30 p.m. (EST).

The NCCS Web site offers information on wide range of cancer topics, including physical changes, emotional effects, health insurance, cognitive changes and more. Other sections provide tips on talking to your doctor, exercise, employment, finances and clinical trials. There is a section for caregivers, and the special needs of children and those facing end of life are also covered. The site provides a glossary and a resource guide with links to other sites. NCCS also offers the Cancer Survival Toolbox, a free audio program that offers tips on communication, decision making, problem solving, and finding information throughout the cancer experience. Information on the site is available in Spanish, and the Cancer Survival Toolbox is available in both Spanish and Chinese.

### Local Resources-

University of Washington Medical Center

Neuropsychology Laboratory

Department of Rehabilitation Medicine

Box 356490

Seattle, WA 98195-6490

Phone: 206-598-4696

Fax: 206-598-4383

Harborview Medical Center

Outpatient Rehabilitation Program

Department of Rehabilitation Medicine

Box 359740

Seattle, WA 98104-2499

Phone: 206-731-2140

Fax: 206-731-8580

### Works Cited

Lance Armstrong Foundation Survivorship Topics

[www.livestrong.org](http://www.livestrong.org)

Cohen, M.Z., & Armstrong, T. "Cognitive dysfunction." In C. Yarbrow, M. Frogge, M. Goodman (Ed.), *Cancer Symptom Management* 3rd Edition: 635-650. Boston: Jones and Bartlett, 2004.

Armstrong, T.S., & Gilbert, M.R. "Central nervous system toxicity." *Current Opinions in Oncology*.