

# Long-Term Agent Orange Effects

An herbicide used in warfare is linked to serious health complications

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Agent Orange (dioxin) was a plant-killing herbicide and defoliant used in the Vietnam War from 1962–1971. The Agent Orange sprayed in Vietnam during what the U.S. military called Operation Ranch Hand was a mixture of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) and other [dioxins](#). Exposure to Agent Orange is linked to certain [cancers](#) and other illnesses.<sup>1</sup>

Dioxin has a long half-life and stays in the body for decades.<sup>2</sup> Disease caused by Agent Orange may be passed on to future generations and can cause disabilities, birth defects such as [spina bifida](#), and certain types of cancers.<sup>3</sup> Compensation benefits are available to Vietnam veterans exposed to Agent Orange and their affected offspring.<sup>4</sup>

This article provides a brief history of Agent Orange's role in the Vietnam War and discusses the long-term effects of exposure to the toxic dioxins in this herbicide.

## A Brief History of Agent Orange

Agent Orange gets its name from an orange stripe painted on its storage containers. During the Vietnam War, the United States government commissioned chemical companies like Monsanto and Dow to manufacture Agent Orange under the U.S. Defense Production Act of 1950.<sup>5</sup>

The United States banned Agent Orange in the early 1970s when the Environmental Protection Agency (EPA) established that herbicides containing dioxins are carcinogenic. In 1984, a class-action lawsuit by over 100,000 Vietnam veterans led to the Agent Orange Act of 1991 and presumptive disability benefits for those exposed to it herbicide during military service.<sup>6</sup>

### What Are Presumptive Disability Benefits?

The Veterans Benefits Administration automatically presumes that certain diseases and disabilities were caused by military service; they call these "presumptive conditions." The benefits given to someone with a presumptive condition are called "presumptive disability benefits."<sup>7</sup>

## United States Involvement in Vietnam

In 1962, the United States Department of Defense (DOD) started using herbicides like Agent Orange to defoliate Vietnamese jungles and farmland in an attempt to make it easier for American combat troops to detect enemy forces and disrupt the enemy's food supply chain.<sup>8</sup> From 1962–1971, the U.S. Air Force sprayed at least 11 million gallons of Agent Orange in Vietnam.<sup>9</sup>

## Impact on the Vietnamese

Even though the U.S. military stopped spraying Agent Orange in the early 1970s, the dioxins in this herbicide continue to have an impact on Vietnamese people over a half-century later. For example, ponds at a former U.S. air base in Bien Hoa, Vietnam, are still contaminated with Agent Orange in 2023. When Vietnamese people eat fish from these ponds, they are exposed to dioxins.<sup>10</sup>

In December 2022, the United States announced a \$29 million contract to clean up dioxin-contaminated soil and water at the Bien Hoa Air Base in southern Vietnam.<sup>11</sup>

### How Does Agent Orange Impact the Environment?

When Agent Orange is introduced into an ecosystem, it stays there for a very long time. Dioxin has a long half-life and is hydrophobic, meaning that it doesn't dissolve in water. When dioxins contaminate soil or water supplies, the food generated from these sources can be toxic.<sup>12</sup>

## What Are the Long-Term Effects of Agent Orange?

The dioxins in Agent Orange are highly lipophilic, meaning that they dissolve in fat and are stored in the body's [adipose tissue](#) (body fat). Dioxins metabolize slowly.<sup>13</sup> One of the primary long-term effects of Agent Orange is that it can accumulate in fatty tissue and remain there for decades.

## Associated Diseases

The Veterans Administration (VA) recognizes that certain cancers and other so-called "presumptive conditions" are associated with Agent Orange exposure during military service. Veterans and their offspring/children, who may also be Agent Orange victims, might be eligible for benefits if they have one of the following diseases or Agent Orange neurological disorders:<sup>14</sup>

- AL [amyloidosis](#)
- [Bladder cancer](#)
- Chronic B-cell [leukemias](#)
- Chloracne (or similar acneform diseases)
- [Type 2 diabetes](#)
- [Hypertension \(high blood pressure\)](#)
- [Hodgkin lymphoma](#)
- [Hypothyroidism](#)
- [Heart disease](#)
- [Monoclonal gammopathy of undetermined significance \(MGUS\)](#)
- [Multiple myeloma](#)
- [Non-Hodgkin lymphoma](#)
- [Parkinsonism](#)
- [Parkinson's disease](#)
  
- [Peripheral neuropathy](#)
  
- [Porphyria cutanea tarda](#)
  
- [Prostate cancer](#)
  
- Respiratory cancers (including [lung cancer](#))
- [Soft tissue sarcomas](#) (other than osteosarcoma, chondrosarcoma, Kaposi's sarcoma, or mesothelioma)
- [Spina bifida](#) (except for spina bifida occulta)<sup>15</sup>

## Symptom Visibility

[Skin diseases](#) and a form of acne called chloracne are visible symptoms associated with exposure to Agent Orange's main ingredient, 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD). Chloracne is similar to other types of [acne](#) that block hair follicles, such as [acne vulgaris](#).<sup>16</sup> That said, the different diseases Agent Orange can cause each has its own visible symptoms.

# Agent Orange Effects: Passed Down Through Genes?

The question of whether or not Agent Orange's effects are passed down through genes is a controversial topic. Although exposure to Agent Orange is linked to serious health complications and possible birth defects in Vietnam veterans and babies exposed to dioxin in the womb, there isn't a scientific consensus about its intergenerational effects.<sup>17</sup>

In 2018, a systematic review of the long-term health effects of Agent Orange exposure in the Vietnam War concluded that there wasn't sufficient scientific evidence to confirm a link between tactical herbicide exposure and birth defects in the descendants of Vietnam veterans.<sup>18</sup>

A 2014 scientific paper claims that Agent Orange exposure may have caused epigenetic changes in sperm, such as DNA methylation and histone modification, that can be passed down through genes in the male germ line.<sup>19</sup>

The children of women veterans who were in Vietnam between 1961–1975 and had a baby with permanent mental or physical disabilities are eligible for presumptive benefits because the VA presumes Agent Orange caused their baby's long-term disabilities.<sup>20</sup>

To learn more about benefits for children of Agent Orange victims with birth defects, call the VA's Birth Defects Benefits line at **888-820-1756** or TDD (hearing impaired) at **800-829-4833**.

## Disability Benefits for Agent Orange Exposure

The U.S. Department of Veterans Affairs allocates disability benefits for Agent Orange exposure. You can [file a disability claim online](#) using VA Form 21-526EZ (Application for Disability Compensation and Related Compensation Benefits).<sup>21</sup>

You can also [download this form](#), print it out, and mail it to this address:

Department of Veterans Affairs  
Claims Intake Center  
PO Box 4444  
Janesville, WI 53547-4444

The VA also offers [survivors' benefits](#) to spouses, dependent children, and dependent parents of veterans who died of a presumptive condition linked to Agent Orange exposure.

## Eligibility Criteria

To qualify for VA disability benefits related to Agent Orange exposure, both of the following must be true:

1. You have a health condition caused by Agent Orange exposure.
2. You served in the military in a location that exposed you to Agent Orange.

## Additional Resources for Agent Orange Victims

If you are an Agent Orange victim and need one-on-one help filing or appealing a claim, you can reach out to a Veterans Service Officer (VSO) for help. There are two ways to find a VSO:

1. Visit the [eBenefits](#) website to find a local representative.
2. Search the VA Office of the General Counsel's list [here](#).

For general inquiries, you can call the Agent Orange helpline at **800-749-8387 (TTY: 711)** or send an email to **GW/AOHelpline@vba.va.gov**.

## Summary

Agent Orange was a toxic herbicide that the U.S. military used during the Vietnam War. The most harmful ingredient in Agent Orange is called 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD), or simply dioxin. Exposure to dioxins can cause numerous health problems and diseases, such as cancer. Because dioxins have a long half-life (seven to 11 years), they can stay in the body or contaminate food-providing soil and water for decades.

The U.S. military is still in the process of cleaning up Agent Orange contamination in Vietnam. Some children of Vietnam veterans may be eligible for VA benefits if they're living with a permanent mental or physical disability linked to their parents' Agent Orange exposure.