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# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

October 1988

The Agent Orange Briefs are a **series** of fact sheets designed to answer questions regarding Agent Orange and **related** matters. The **Environmental** Medicine Office at VA headquarters **in** Washington, D.C. prepared the fact sheets and is **responsible** for their content. That office plans to update the Briefs on a regular basis. Copies of **all** Briefs are maintained by the Agent Orange Coordinator at **all** VA **medical** centers. Comments about existing Briefs and ideas for future issues **should** be sent to the Environmental Medicine Office (**10B/AO**), Veterans Administration **Central** Office, 810 Vermont Avenue, **N.W.**, Washington, D.C. 20420. The following Briefs are **currently** available:

1. Agent Orange - General Information
2. Agent Orange Registry
3. Agent Orange Litigation
4. Agent Orange - Research Problem
5. Agent Orange - Priority Treatment Program
6. Agent Orange and Birth Defects
7. Agent Orange and Chloracne
8. Agent Orange and VA Disability Compensation
9. Agent Orange and Soft Tissue Sarcoma
10. Agent Orange and Related Research - VA Efforts
11. Agent Orange and **Related** Research - Non-VA Efforts
12. Agent Orange and **Non-Hodgkin's Lymphoma**
13. VA Publications on Agent Orange and Related Matters

# Agent Orange Brief

Prepared by the **Enviornmental** Medicine Office  
VA Central Office, Washington, DC

No. 1

October 1988

## AGENT ORANGE - GENERAL INFORMATION

What is Agent Orange?

Agent Orange was a **herbicide**, or **defoliant**, which was used in Vietnam to **kill** unwanted **plant** life and to remove leaves from trees which otherwise provided cover for the enemy. Agent Orange was a mixture of chemicals containing equal amounts of the two active ingredients, 2,4-D and **2,4,5-T**. The name, "Agent Orange," came from the orange stripe on the **55-gallon** drums in which it was stored. Other herbicides, including Agent White and Agent Blue, were **also** used in Vietnam to a much **lesser** extent.

Why are **Vietnam** veterans concerned about Agent Orange?

In the **1970's** some veterans became concerned that exposure to Agent Orange might cause **delayed** health effects. One of the chemicals (2,4,5-T) in Agent Orange contained minute traces of **2,3,7,8-tetrachlorodibenzo-p-dioxin** (also known as TCDD or dioxin), which has caused a variety of illnesses in animal studies. A more recent study of **agricultural** workers exposed to 2,4-D suggested that that **chemical** may be **related** to a particular cancer.

When and where was Agent Orange used in Vietnam?

Fifteen different herbicides were shipped to and used in Vietnam between January **1962** and September **1971**. Over 80 percent of the herbicides sprayed in Vietnam was Agent Orange, which was used between January **1965** and April 1970. **Herbicides** other than Agent Orange were used in Vietnam prior to 1965, but to a very limited extent. The total area sprayed with herbicides between **1962** and 1965 was **small**, less than 7 percent of the total acreage sprayed during the Vietnam **conflict**. Rapid yearly increases in the annual number of acres sprayed occurred from 1962 to **1967**. The **number** of acres sprayed reached a maximum in **1967**, **leveled off slightly** in 1968 and **1969**, and declined **rapidly** in 1970 prior to the termination of spraying in **1971**. During this time more than 20 **million gallons** of herbicides were sprayed over 6 million acres, some of which were sprayed more than once. More than 3.5 **million** acres of South Vietnam -- **approximately** 8.5 percent of the country -- were sprayed one or more times. Spraying occurred in **all** 4 military zones of Vietnam.

**Heavily** sprayed areas were inland forests near the demarcation zone; **inland** forests at the junction of the borders of Cambodia, Laos, and South Vietnam; **inland** forests north and northwest of Saigon; mangrove forests on the southernmost peninsula of Vietnam; and mangrove forests **along** major **shipping channels** southeast of Saigon. Crop **destruction missions** were concentrated in northern and eastern **central** areas of South Vietnam.

What should concerned veterans do?

In **1978**, the Veterans Administration set up a **special** examination program for Vietnam veterans who were worried about the **long-term health** effects of exposure to Agent Orange. Vietnam veterans who are **interested** in participating in this program should contact the nearest VA **medical** center for an **examination**. An appointment usually can be arranged within two to three weeks.

**What** can a veteran expect from this examination?

Veterans who participate in the examination program are asked a series of questions about their **possible** exposure to herbicides in Vietnam. A medical history is taken, a **physical** examination is performed, and a **series** of basic **laboratory** tests, such as a chest x-ray, **urinalysis**, and blood tests, are done. No special Agent Orange tests are offered since, there is no test to show if a **veteran's** medical **problem** was caused by Agent Orange or other herbicides used in Vietnam. There are tests that show the **level** of **dioxin** in human fat and **blood**, but such tests are not done **by** the the VA because they do not **help** veterans in any way. In scientific studies, people with "high" **levels** of dioxin are in the same general health as those with "**low**" dioxin **levels**. **Almost** everyone has some dioxin in his body. If the examining physician thinks it is medically indicated, consultations with other physicians are set up.

How does a veteran benefit from taking the VA Agent Orange Registry **examination**?

The veteran is **told** of the results of the examination and gets a written report. Each veteran is given the opportunity to ask for an explanation and advice. Where **medically** necessary, a follow-up **examination** or **additional** laboratory tests are **scheduled**. The **examination** and tests sometime reveal **previously** undetected **medical** problems. These **discoveries** permit veterans to get prompt treatment for their **illnesses**. Some veterans think they are in good health, but are worried that exposure to Agent Orange and other substances may have caused some hidden **illness**. The knowledge that a **complete** medical examination does not show any **medical problems** can be very reassuring or **helpful** to these veterans. All examination and test results are kept in the **veteran's** permanent **medical** record. This **information** is **also** entered into the computerized VA Agent Orange Registry. So far about 230,000 Vietnam veterans have participated in this program. For more information about the VA Agent Orange **Registry**, see Agent Orange Brief, Number 2.

Can a veteran get treatment for Agent **Orange-related illnesses**?

In addition to the Agent Orange Registry examination program, the VA also provides special priority treatment to Vietnam veterans for conditions that may be, but **are not necessarily**, related to Agent Orange exposure. For information about the priority treatment program, see Agent Orange **Brief**, Number 5.

Can veterans get disability compensation for Agent Orange Illnesses?

The VA also pays **disability** compensation to many Vietnam veterans with injuries or **illnesses** incurred in or aggravated by their military service. Veterans do not have to prove that Agent Orange caused their **medical** problems to be **eligible** for compensation. Rather, the VA must determine that the **disability** is "**service-connected.**" A Veterans Benefits Counselor, at any VA medical center or **regional** office, can explain the compensation program in greater detail and can assist veterans who need **help** in applying. For more information about the VA **disability** compensation program, see Agent Orange Brief, Number 8.

What else is the VA doing?

In addition to the efforts described above (that is, Agent Orange Registry examination program, priority treatment, and disability **compensation**), the VA is doing research to learn more about the **possible** adverse **health** effects of Agent Orange exposure. The VA has completed two studies about **possible** connections between Vietnam service and specific kind of cancers **called** soft tissue sarcomas, and a large scale study of **mortality** among Vietnam veterans. For information about soft tissue sarcoma, see Agent Orange Brief, Number 9. For information about VA research efforts, see Agent Orange Brief, Number 10. In 1981, the VA **published** a two-volume report reviewing scientific **literature** on herbicides in the United States and throughout the world. This **publication** was updated with an additional two **volumes** in 1984, **1985**, **1986**, **1987**, and **1988**. Lay language summaries of the scientific reviews have also been published. The VA has also published a series of monographs regarding Agent **Orange-related** matters. For additional information on these publication, see Agent Orange Brief, Number **13**. Since **1979**, the VA has been part of an **interagency** group monitoring and coordinating Agent Orange- and **dioxin-related** research within the **Federal** government. The VA has two advisory committees to assist the Administrator, who leads the VA, in developing appropriate **policy**.

**What** are other government **agencies** doing?

Many other Federal agencies are also doing scientific studies on this subject. The CDC (Centers for Disease Control), Air Force, National Institute for Occupational Safety and **Health**, National Cancer Institute, and Environmental Protection Agency have all been **involved** in research. The CDC published an important study in 1984 regarding Vietnam **veterans'** risks of fathering babies with birth defects. The VA provided partial funding for this study. CDC investigators found that Vietnam veterans were not at increased risk of fathering a child with birth defects. The

VA also funded the CDC Vietnam Experience Study published in 1987 and 1988. CDC is currently pursuing a Selected Cancers Study on behalf of the VA. The Air Force is conducting a long-term study of mortality and morbidity among the men involved in the herbicide spraying missions. The National Institute for Occupational Safety and Health is maintaining a registry of individuals exposed to dioxins and other chemicals in the workplace. The National Cancer Institute has studied the health effects of herbicides on selected agricultural workers. The Environmental Protection Agency is working with the VA on the Retrospective Study of Dioxins and Furans in Adipose Tissue. A considerable amount of research has been undertaken by Federal agencies. According to a special report issued by the Domestic Policy Council's Agent Orange Working Group in September 1987, "There are 70 ongoing projects and 80 completed projects." The report indicates "that over \$91 million has been spent on the completed projects, an additional \$120 million has been spent" on the ongoing projects. Several States also have undertaken research efforts to learn more about the possible health effects of Agent Orange and the Vietnam experience upon our Nation's veterans. Research being done by non-VA agencies and organizations is more fully described in Agent Orange Brief, Number 11.

Where is additional Information available?

There is at each VA medical center a specially trained "Environmental Physician" responsible for the conduct of Agent Orange Registry examinations. These individuals participate in regularly scheduled nationwide conference calls and receive mailouts from VA headquarters updating them on the latest developments on Agent Orange. Each facility also has an "Agent Orange Coordinator" to facilitate the Agent Orange program. As indicated above, other Agent Orange Briefs provide additional information on specific Agent Orange concerns and issues. The Agent Orange Briefs are available at all VA medical centers. The Environmental Medicine Office (10B/AO), Veterans Administration Central Office, 810 Vermont Avenue, N.W., Washington, D.C. 20420, is another good source of information on this subject. The Environmental Medicine Office used to be known as the Agent Orange Projects Office.

# Agent Orange Brief

Prepared by the Environmental Medicine **Office**

VA Central Office, Washington, DC

October 1988

No. 2

## AGENT ORANGE REGISTRY

What **is** it?

In **mid-1978** the Veterans Administration (VA) set up a register of Vietnam veterans who were worried that they may have been exposed to **chemical** herbicides which might be causing a variety of **ill** effects and who took an extensive medical examination offered at **all** VA facilities. The Agent Orange Registry is a computerized index of those examinations.

What should a participating veteran expect?

Each veteran participating in this voluntary program, offered at all VA **medical** centers, is given the **following** baseline laboratory studies: chest x-ray (if one has not been done within the past 6 months); complete **blood** count; **blood** chemistries and enzyme studies; and **urinalysis**. Evidence is also sought concerning the following **potentially** relevant symptoms or conditions: **altered** sex drive; **congenital** deformities (birth defects) among children; neoplasms or cancers, **including** soft tissue sarcoma and **lymphoma (including non-Hodgkin's lymphoma)**; repeated infections; **sterility**; and difficulties in carrying pregnancies to term (a problem experienced by the wives of some Vietnam **veterans**).

How does a veteran benefit from **taking** the Agent Orange Registry examination?

The examination provides the participating veteran with an opportunity to receive a **complete** health evaluation and answers to questions concerning the current state of **knowledge** regarding the **relationship** between herbicide exposure and subsequent **health** problems. Following completion of the examination, the veteran is given the results of the physical exam and laboratory studies. This information is provided to the veteran by both a face-to-face **discussion** with a physician familiar with the health aspects of the Agent Orange issue and a follow-up **letter** summarizing the **results** of the examination. **Occasionally, previously** undetected medical **problems** are found. With prompt attention, many times these illnesses may be **successfully** treated. The Registry permits the VA to contact veterans for further testing if continuing research efforts should make this action **advisable**.

Does the Agent Orange Registry have an Impact on research efforts?

The Registry **provides** a means of detecting **clues** or suggestions of specific **health** problems **in** the event that unexpected or **unusual** health trends show up **in** this group of veterans. Such clues could then form the basis for the design and conduct of specific **scientific** studies.

Who **is** eligible?

Any veteran, male or **female**, who had active military service in the **Republic** of Vietnam between 1962 to 1975, and expresses a concern **relating** to exposure to herbicides may participate in the Registry. **Eligible** veterans who want to participate in this program **should** contact the nearest VA medical facility for an appointment. A veteran who did not serve in Vietnam is not **eligible** for the Agent Orange Registry examination. **Similarly**, the spouses and children of veterans are not **eligible** for this examination.

What are the limitations and uses of the Registry?

It is important to understand that the Agent Orange Registry is not a scientific study. Because of the **self-selected** nature (that is, the **individuals** decide themselves to be part of the **Registry** rather than being "chosen" in a scientific manner) of the Registry participants, this group of veterans cannot, with any scientific **validity**, be viewed as being representational of Vietnam veterans as a **whole**. Therefore, the **health-related** information **collected** cannot be used for scientific research. The information can, however, be used to detect **possible health** trends, as noted above, and can provide some useful facts about the group itself. For example, it is possible to show the numbers in each branch of military service, the **period(s)** of service in Vietnam, kinds of symptoms veterans are experiencing, and some of the **results** of the physical examinations. From this type of information, it is **possible** to develop the **relative** frequency or **internal** proportional distribution of certain health problems. That is, we could find that health condition "A" is **appearing** in five times as many Registry participants as **problem "B."** However, since participation in the Registry program is **entirely** voluntary, one cannot make **statistically valid** comparisons directly between this group of veterans and other groups of veterans or non-veterans.

Who has **participated in** the Registry?

More than 230,000 Vietnam veterans have **already** participated in this program. **Although** the program is now more than **10** years old, hundreds of veterans are **still** contacting the VA each week for their initial Registry **examination**. Many of these veterans have no **medical problems**; others present a wide range of **ailments**. Veterans interested in receiving the Agent Orange Registry examination **should** contact the nearest VA medical center.



If a veteran who has participated in the Agent Orange **Registry** examination program changes **residence** who should he or she contact?

A veteran who moves **after** receiving the Agent Orange examination **should** contact the Agent Orange Coordinator at the nearest VA medical center and the Agent Orange Clerk (200/397B), VA Data Processing Center, **1615** East Woodward Street, Austin, Texas 78772. Both the old and new addresses **should** be indicated.

If a Vietnam veteran receives an Agent Orange Registry examination, does that automatically make **him** or her **eligible** for disability compensation?

No. Veterans who wish to be considered for **disability** compensation must file a claim for that benefit. Many Agent Orange Registry participants have no **medical** problems. For more information regarding disability compensation, see Agent Orange Brief, Number 8.

Who should be contacted for additional **information** regarding the Agent Orange Registry?

At each VA medical center there is a **specially** trained "Environmental Physician" responsible for the conduct of Agent Orange Registry examinations. These individuals participate **in regularly scheduled nationwide** conference calls and receive **mailouts** from VA headquarters updating them on the **latest** developments on Agent Orange. Each medical center also has an Agent Orange Coordinator who has a great deal of **information** about the Agent Orange Registry and **related** matters. The VA **medical** center libraries **also** have considerable information, **including** videotapes, regarding Agent Orange. The Environmental **Medicine** Office (10B/A0), Veterans Administration **Central Office**, 810 Vermont Avenue, N.W., Washington, D.C. 20420, is another good source of information on this subject.

# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

No. 3

October 1988

## AGENT ORANGE LITIGATION

What is **it**?

In re "Agent Orange" Product **Liability** Litigation is the name of the **class** action **lawsuit** brought by **Vietnam** veterans and their family members against seven **chemical** companies for injuries the veterans **believed** were caused by exposure to Agent Orange and other herbicides in Vietnam. More than 200,000 veterans joined the class action claiming a large number of diseases they believe related to Agent Orange. On May 7, 1984, a settlement was reached in which the manufacturers agreed to pay **\$180 million**. Since the suit did not go to trial, no specific diseases were associated with Agent Orange, and it has been difficult to determine who **should** receive this money.

What **is** the status of this settlement?

For more than four years, various **groups** challenged the settlement for a variety of reasons. In mid-1988 the U.S. Supreme Court **declined** to review rulings that dismissed **lawsuits** brought by veterans and others who **challenged** the settlement. Currently, the survivors of deceased Vietnam veterans and **totally** disabled veterans who were exposed to Agent Orange are **scheduled** to receive settlement funds. It is anticipated that the first payments **will** be made in 1989. The Court has designated Aetna Life Insurance Company to serve as the **claims** administrator for the program.

Are the VA and other government agencies **involved** in **this** settlement?

No. Neither the Veterans Administration nor any other **Federal** agency is directly **involved** in the distribution of the settlement assets.

How can an Individual or group get additional Information on the settlement?

Information can be obtained by either **calling** a **toll-free** telephone number, 1-800-225-4712 (recorded message), or by writing to the Agent Orange Veteran Payment Program, P.O. Box **110**, Hartford, **Connecticut** 06104.

# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

No. 4

October 1988

## AGENT ORANGE - RESEARCH PROBLEM

Why was the CDC Agent Orange Study **cancelled**?

In December **1979**, Congress directed the VA to conduct a **large-scale epidemiological** study to determine if Agent Orange has caused **health** problems in Vietnam veterans. For **approximately** 3 years the VA and its contractor attempted to develop an adequate protocol or study design. The VA, at the suggestion of Congress, then transferred **responsibility** of the study to the Centers for Disease Control (CDC). **Unfortunately** after several years of research, CDC found that **military** records were unable to identify individuals who were exposed to Agent Orange in Vietnam. **Subsequently**, CDC did a **special** Agent Orange Validation Study to determine the feasibility of conducting the Agent Orange Study using indirect estimates of exposure to Agent Orange from military records (and self reports) and by comparing such measures with serum **levels** of **2,3,7,8-TCDD (dioxin)**. CDC maintained that the findings of the Agent Orange Validation Study confirmed **conclusively** that neither **military** records nor **veterans' self** reports of exposure to Agent Orange can identify exposed **individuals** needed for a **full** scale study. This conclusion was agreed to by the Science Panel of the Domestic Policy Council Agent Orange Working Group and Agent Orange Advisory **Panel** of the **Congressional** Office of **Technology** Assessment. Consequently, the study was **cancelled**. It **should** be noted that some **people** believe that an index of Agent Orange exposure for ground troops can still be developed. Scientists in New Jersey are using different study methodologies **involving** small groups of exposed subjects in different categories of **military** units.

What can be done?

**While** the CDC Agent Orange Study could not be successfully **completed**, a **substantial** number of **related** research efforts have been completed and **published**, and other scientific **studies** are ongoing. The VA, CDC, Air Force, and several other agencies and organizations are doing this important research. For information about these projects, see Agent Orange Briefs, Numbers 10 and **11**.

Who **should** be contacted for **additional information** regarding the **cancellation** of the CDC Agent Orange Study and the difficulties experienced in pursuing Agent Orange research?

Questions **concerning** the CDC Study can be directed to the Center for Environmental **Health**, Centers for Disease **Control**, Atlanta, Georgia 30333. Other matters can be handled by the Environmental Physician at the nearest VA **medical** center or by the Environmental Medicine **Office (10B/A0)**, Veterans **Administration** Central Office, 810 Vermont Avenue, **N.W.**, Washington, D.C. 20420.

# Agent Orange Brief

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VA Central Office, Washington, DC

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October 1988

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While the CDC Agent Orange Study could not be **successfully completed**, a substantial number of related research efforts have been completed and published, and other scientific studies are ongoing. The VA, CDC, Air Force, and several other agencies and organizations are doing this important research. For information about these projects, see Agent Orange Briefs, Numbers 10 and 11.

Who **should** be contacted for additional **information** regarding the **cancellation** of the CDC Agent Orange Study and the difficulties experienced **in pursuing** Agent Orange research?

Questions concerning the CDC Study can be directed to the Center for Environmental **Health**, Centers for Disease **Control**, Atlanta, Georgia 30333. Other matters can be **handled** by the Environmental Physician at the nearest VA **medical** center or by the **Environmental Medicine Office** (10B/AO), Veterans Administration **Central Office**, 810 Vermont Avenue, N.W., Washington, D.C. 20420.

# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

No. 5

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## AGENT ORANGE - PRIORITY TREATMENT PROGRAM

### What is it?

The VA (Veterans Administration) provides **certain health** care services to any veteran of the Vietnam era (August 5, 1964 - May 7, 1975) who may have been exposed to **dioxin** in a herbicide used for **military** purposes in Vietnam. Proof of service in Vietnam is required. Without affirmative evidence to the contrary, a Vietnam **veteran's** contention of exposure **will** be accepted. Health care services under this program are **limited** to hospital and nursing home care in VA facilities and **outpatient** care **in VA facilities** on a pre- or **post-hospitalization** basis or to prevent a need for **hospitalization**.

**Health** care services will be provided without regard to the **veteran's** age, service-connected status or the **veteran's** ability to pay for the expenses of such care. Veterans receiving outpatient care under this program **will** be given priority ahead of **nonservice-connected** veterans and **equal** to former Prisoners of War who are receiving care for nonservice-connected conditions.

A decision by the VA that a veteran is **eligible** for **health** care does not constitute a basis for service-connection or in any way affect determinations regarding service-connection.

### Who is eligible for this priority treatment?

When a **Vietnam** veteran requests VA **medical** care he or she **will** be evaluated **clinically** through a physical examination and appropriate diagnostic studies. This may, but need not, be the Agent Orange **Registry examination**. If such an examination has been completed **within** the prior 6 months, only those procedures which are medically **indicated** by the current **circumstances** need be repeated. Where the findings **reveal** a condition requiring treatment, the responsible VA staff **physician will** make a determination as to whether the condition resulted from a cause other than exposure to dioxin or herbicides. In making this determination, the physician should **consider** that the **following** types of conditions are not **ordinarily** considered to be due to such exposure:

- (1) congenital or developmental conditions, e.g., **spina bifida; scoliosis**.
- (2) conditions which are known to have pre-existed military service.
- (3) conditions resulting from trauma, e.g., deformity or limitation **of motion of an extremity**.

- (4) conditions having a **specific** and **well established etiology**, e.g., tuberculosis; gout.
- (5) common conditions having a **well** recognized **clinical** course, e.g., **inguinal** hernia; acute appendicitis.

On occasion, the responsible staff physician may find that a veteran requires care for one or more of the **conditions** listed above, but that the patient presents complicating circumstances that make the provisions of care under this program appropriate. After consultation with the Chief of Staff and the **Environmental** Physician authorization for priority treatment may be granted.

Under what authority does the VA provide this priority **treatment**?

The Veterans' Health Care, Training, and Small Business Loan Act of **1981**, **Public** Law 97-72, enacted November 3, **1981**, **established** the priority treatment. The **Veterans' Administration** Health-Care Amendments of 1985, Public Law 99-166, enacted December 3, 1985, extended the program through September 30, 1989. The **Veterans' Administration** Adjudication Procedure and **Judicial** Review Act extended the program through December 31, **1990**.

Where can a veteran obtain **additional information** on **this** priority treatment program?

Questions concerning priorities for medical care **should** be directed to the Medical Administration Service of the nearest VA **medical** center.



# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

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No. 6

## AGENT ORANGE AND BIRTH DEFECTS

Does exposure to Agent Orange or service in Vietnam increase the **likelihood** of a veteran fathering a child **with** birth defects?

One of the most emotional aspects of the Agent Orange Issue is the concern that exposure to herbicides in Vietnam may have caused or contributed to the risks of having babies with birth defects. **Literally** thousands of Vietnam veterans have fathered **children** with abnormalities. Considering the fact that approximately 2.6 **million** veterans served in Vietnam and the fact that 3-6 percent of **all** children are born with some kind of defect, scientists expect to see many **children** with abnormalities among the offspring of Vietnam veterans. **Unfortunately**, in many instances scientists cannot explain what caused these birth defects. Research has been conducted to determine whether exposure to Agent Orange or **military** service in Vietnam may have increased the risk of fathering **children** with birth defects. Based on the research **completed** to date, the answer seems to be "no." The Australian birth defects study, the CDC (Centers for Disease Control) birth defects study, the Air Force Health Study (Ranch Hand), and the CDC Vietnam Experience Study **all** suggest that Agent Orange is not the most likely cause of the birth defects. Each of these investigations are briefly summarized below.

**Case-Control Study of Congenital Anomalies and Vietnam Service (Birth Defects Study)** - Report to the **Minister** for veterans' Affairs - January 1983 - Prepared by J. W. Donovan and others. This **Australian** investigation involved examination of the hospital and laboratory records of infants born with birth defects in three **populous** areas of Australia between the years 1966 and 1979. In all, 34 **hospitals** and 4 **laboratories** cooperated **fully** with the investigating team. Whenever the birth of an infant with a defect was found, it was matched to a **healthy** control infant born in the same **hospital**, to a mother of **similar** age, and as close as **possible** in time to the birth of the **child** with the defect. The fathers of both cases (for this study, a case **is** a baby with a birth defect) and controls (for **this** study, a control is a baby without a birth defect) were identified in 8,517 instances and those identified were compared with a **list** of every man who served in the **Australian Army** between 1962 and 1972, the period of **Australian involvement** in Vietnam. Fathers who served in the Army during this period were then classified according to whether they had served in Vietnam. The important finding of the study is that **127** of the fathers of children with birth defects were Vietnam veterans and **123** veterans were among the fathers of **healthy** children. This **indicates** that there is no evidence that Army service in Vietnam **increased** the risk of fathering a **child with** a birth defect.

Vietnam Veterans' Risks for Fathering Babies **with** Birth Defects - August 1984 - U.S. Department of Health and Human Services, **Public Health Service, Centers for Disease Control, Center for Environmental Health.** Vietnam **veterans'** risks for fathering babies with major structural birth defects were assessed using a **case-control** study. Information regarding **military** service in Vietnam was obtained from interviews with mothers and fathers of babies in case and control groups and from review of military records. Vietnam veterans did not have an increased risk of fathering babies with defects. **Futhermore,** Vietnam veterans who had greater estimated opportunities for Agent Orange exposure were not at greater risk for fathering babies with **all** types of defects combined.

Air Force Health Study (Project Ranch Hand II) - An **Epidemiologic Investigation of Health Effects in Air Force Personnel Following Exposure to Herbicides** - Periodic reports on morbidity (health problems) - Prepared by George D. Lathrop, William H. **Wolfe** and others. The February 1984 **Baseline** Morbidity Study Results indicated that there was no significant differences between the Ranch Hand (the **military** unit that did most of the herbicide spraying in Vietnam) and control groups with regard to severe or moderate birth defects. Based on parental reports, however, Ranch Hand offspring showed significantly more minor birth defects (birth marks, **etc.**). In **1988,** Air Force investigators indicated the **baseline** findings of overall group differences in reported birth defects are being **reinvestigated** with **full medical** record verification of the birth defects reported on **all children** fathered by study participants. Over 6,000 medical records are under review. The Air Force expects to **complete** this analysis in late 1989.

**Health Status of Vietnam Veterans - Reproductive Outcomes and Child Health** - The Centers for Disease **Control** Vietnam Experience Study - May **1988.** The Vietnam Experience Study was a **multidimensional** assessment of the **health** of Vietnam veterans. From a random **sample** of enlisted men who entered the U.S. Army from 1965 through 1971, 7,924 Vietnam and 7,364 non-Vietnam veterans participated in a **telephone** interview; a random **subsample** of 2,490 Vietnam and 1,972 non-Vietnam veterans **also** underwent a comprehensive medical examination. **Children** of Vietnam veterans were not more likely to have birth defects recorded on **hospital** birth records than were **children** of non-Vietnam veterans. The rates of total, major, **minor,** and suspected defects were similar among **children** of Vietnam and non-Vietnam veterans.

What can a Vietnam veteran now assume about the risks of birth defects?

Many Vietnam veterans have produced **children** with birth defects. In the future, Vietnam veterans **will** produce more **children** with birth defects. Unfortunately, that much is a certainty. The **critical** question is "are Vietnam veterans more **likely** than other men to father children with birth defects? Based on all we know from the **scientific** research described above and studies of **dioxin-contaminated** areas in Times Beach, Missouri, and Seveso, Italy (where investigators recently **concluded** "that the data collected contain no evidence ... that in the **population** of the Seveso area exposed to **dioxin,** there was greater risk of producing **congenitally**

**malformed offspring.**"), Vietnam veterans do not seem to be at increased risk of fathering **children** with birth defects. (A **relatively small** number of women served in Vietnam. It is unlikely that many of them were exposed to Agent Orange. Research is underway to **learn** more about what effects Vietnam service may have had on their health. There is no **scientific** evidence **that** women have mothered an unexpected high number of **children** with birth defects.)

Where can a concerned veteran get additional Information about birth defects?

In October **1985**, the VA published a monograph **entitled** "Birth Defects and Genetic Counseling." This **publication** was distributed to **all** VA **medical** center libraries in 1985. A limited **supply** of **complimentary** copies is currently available from the Environmental Medicine Office (10B/A0), Veterans Administration **Central** Office, 810 Vermont Avenue, **N.W.**, Washington, D.C. 20420. The March **of Dimes** Birth Defects Foundation is also an **excellent** source of information on this subject. The address is **Professional** Education, March of Dimes Birth Defects Foundation, **1275** Mamaroneck Avenue, White **Plains**, New York 10605.

# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

October 1988

No. 7

## AGENT ORANGE AND CHLORACNE

What **is** chloracne?

**Chloracne** is a skin condition that **looks like** common forms of acne that affect teenagers. At present, chloracne is the **only well** established **long-term** effect of exposure to TCDD or **dioxin**, the contaminant found in one of the ingredients of Agent Orange.

What does chloracne look **like** and where does it appear?

The first sign of chloracne may be excessive **oiliness** of the skin. This is accompanied or **followed** by the appearance of numerous blackheads. In mild cases the **blackheads** may be **limited** to the area around the eyes extending **along** the **temples** to the ears. In more severe cases blackheads may appear in many places on the body, **especially** over the **malar** (or cheek bone) area, other **facial** areas, behind the ears, and **along** the arms. The blackheads are **usually** accompanied by **fluid-filled** cysts and by an increased or darker growth of body hair. The skin may become thicker and **flake** or peel. In severe cases, the acne may result in open sores and permanent scars. The condition fades **slowly** after exposure. Minor cases may disappear altogether, but more severe cases may persist for years after the exposure.

Physicians, even **dermatologists**, sometimes have difficulty in distinguishing **chloracne** from other more common skin disorders. **While** chloracne may be a sensitive indicator of exposure to **dioxins** in some **people**, it may not be in other individuals who had **equal** or greater exposure to dioxins. The absence of chloracne is not necessarily a **reliable** basis for **concluding** that a person has not been exposed to a **chemical** which is known to cause chloracne.

Has **chloracne** been a **problem** for a **large** number of Vietnam veterans?

No, **it has** not. Of course, many veterans have complained of skin problems. Skin ailments are the most common medical problem in veteran and non-veteran populations.

# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

No. 8

October 1988

## AGENT ORANGE AND VA DISABILITY COMPENSATION

What is disability compensation and who is eligible for this benefit?

Veterans who are disabled by injury or disease incurred or aggravated during active service in the **line** of duty **during** wartime or peacetime service and discharged or separated under other than dishonorable conditions are eligible for monthly payments from the Veterans Administration. The amount of these payments, **called** disability compensation, is based on the degree of disability. For **example**, a veteran with a 30 percent service-connected disability **would** receive more money than a veteran with a 10 or 20 percent **disability**. A veteran who is **totally** disabled **would** receive substantially more than a veteran with a lesser **disability**.

Does exposure to Agent Orange **qualify** Vietnam veterans for **disability** compensation?

No. Mere exposure to Agent Orange and other **chemicals** used in military service does not **automatically** qualify Vietnam veterans for **compensation**. As mentioned above, payments are based on disabilities. Many Vietnam veterans who were exposed to Agent Orange have no serious medical problems. Some Vietnam veterans have disabilities **clearly** unrelated to their **military** service. For **example**, a Vietnam veteran may have been in an automobile accident **10** or **15** years after leaving military service. Under the **law**, disability compensation can **only** be approved for conditions incurred in or aggravated during military service.

If a veteran has a **disability** that he or she believes was caused by Agent Orange exposure or some other aspect of military service, what should he or she do?

To receive disability compensation, the veteran must **file** an application for such benefits. For information or assistance in **applying**, the veteran can write, **call**, or visit a veterans benefits counselor at the nearest VA **regional** office or VA office, or a **local** veterans **service** organization representative.

What should a veteran do if **his** or her claim for disability compensation is denied by the VA?

**While** the VA provides **billions** of **dollars** to veterans and their survivors in disability compensation each year, the VA is not able to approve every

**claim.** When a claim is **denied**, the VA provides the applicant with the reason for this action as well as detailed information regarding **appeal** rights.

If a Vietnam veteran receives an Agent Orange Registry examination, does that **automatically** make **him** or her eligible for **disability** compensation?

No. Veterans who wish to be considered for **disability** compensation must **file** a claim for that benefit. Many Agent Orange Registry participants have no medical **problems** whatsoever.

# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

No. 9

October 1988

## AGENT ORANGE AND SOFT TISSUE SARCOMAS

What are soft tissue sarcomas?

The term "soft tissue sarcoma" is used to describe a group of **approximately** 25 different types of **malignant** tumors which arise from body tissues such as **muscle, fat, blood** and lymph **vessels** and connective tissues (that is distinct from hard tissue such as bone or **cartilage**). These tumors are **relatively** rare.

Why are Vietnam veterans concerned about soft tissue sarcomas?

The possibility that exposure to phenoxy herbicides, such as Agent Orange, may have caused rare forms of cancer in humans such as soft tissue sarcoma was suggested in 1979 and **1981** by small **scale** studies conducted in Sweden. These studies showed that persons reporting occupational exposure to phenoxy herbicides may have a 5 to 6 fold higher risk of **developing** soft tissue sarcoma as compared to persons without such exposure.

Have more recent research results supported or conflicted **with** the Swedish studies finding regarding soft tissue sarcomas?

A number of scientific studies of soft tissue sarcoma among people who may have been exposed to herbicides and/or **dioxins** have been published in the past few years. Some studies suggested a **possible** association between these exposures and an increased risk of some cancers, but none showed an increased risk of soft tissue sarcomas on the magnitude cited by the Swedish researchers, and the majority of these investigations showed no association at all. **Mortality** studies conducted by Massachusetts and West Virginia indicated that there **might** be a link between service in Vietnam and soft tissue sarcoma. The **small** number of deaths in the West Virginia study makes it **possible** that these findings were the **results** of chance rather than real association. A New York State study showed that fewer Vietnam veterans died of soft tissue sarcoma than Vietnam-era veterans who did not serve in Vietnam. A study in New **Zealand** of soft tissue sarcomas and exposure to phenoxy herbicides and chlorophenols, a **National** Cancer Institute study of agricultural herbicide use and risk of **lymphoma** and soft tissue sarcoma in Kansas, the VA (Veterans **Administration**) Vietnam veterans mortality study, and two VA studies of the **relationship** between soft tissue sarcomas and military

service in Vietnam have not supported the findings of the Swedish researchers. At the present time, there is no conclusive evidence **linking** soft tissue sarcomas in Vietnam veterans with herbicides or military service in Vietnam. Very few cases of soft tissue sarcomas are appearing in the Agent Orange Registry. Research on soft tissue sarcoma and other cancers is continuing.

Where can a veteran get **additional information** on this subject?

Information on soft tissue sarcomas and related matters can be obtained at VA medical center libraries, from the Environmental **Physicians** at every VA medical center, or from the **Environmental Medicine Office (10B/AO)**, Veterans Administration **Central Office**, 810 Vermont Avenue, N.W., Washington, D.C. 20420.



# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

No. 10

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## AGENT ORANGE AND RELATED RESEARCH

### VA EFFORTS

Vietnam Veterans **Mortality** Study (Proportionate Mortality Study of Army and Marine Corps Veterans of the Vietnam War) - The **results** of this study were released in September **1987**. **Patterns** of mortality among 24,235 Army and Marine Corps Vietnam veterans were compared with that of 25,685 non-Vietnam veterans using standardized **proportional** mortality ratios. The study subjects were a random sample of deceased Vietnam era veterans identified in a VA computerized benefit **file**. **Military** service information was obtained from **military personnel** records, and cause of death information from death certificates. Statistically significant excess deaths were observed among Army Vietnam veterans for motor **vehicle** accidents, non-motor vehicle accidents and **accidental** poisonings. **Similar** findings have been reported in other studies of Vietnam veterans. Suicides were not elevated among Vietnam veterans. Marine Corps Vietnam veterans appeared to have an **increased** mortality from lung cancer and **non-Hodgkin's lymphoma**. The study did not investigate possible causes of these findings. Follow-up research is now underway. The study was **published** in the Journal of Occupational Medicine in May 1988.

Soft Tissue Sarcoma Study (Soft Tissue **Sarcoma** and **Military Service** in Vietnam: A Case **Control** Study) - This study was conducted of men **who** were of **draftable age** during the Vietnam conflict to examine the association of soft tissue sarcomas with military service in **Vietnam** as well as other **environmental** risk factors. A **total** of 217 soft tissue sarcomas cases **selected** from the Armed Forces Institute of **Pathology** were compared to 599 **controls** for Vietnam service occupational and **non-occupational** exposure to various **chemicals**, **occupational** history, **medical** history, and **life-style** (smoking, alcohol, coffee, etc.). The results of the study indicate that Vietnam veterans did not have an increased risk of soft tissue sarcoma when compared to those men who had never been in Vietnam. The study was **published** in the Journal of the National Cancer Institute in October **1987**.

Soft Tissue **Sarcoma Review** (Soft Tissue Sarcomas and **Military Service** in Vietnam: A Case Comparison **Group Analysis** of **Hospital Patients**) - This study reviewed soft tissue sarcoma cases among Vietnam era veterans who were admitted to VA **medical** centers during the period **1969-1983**. This effort compared location, **histopathology** and relative frequency of soft tissue sarcomas between Vietnam veterans and non-Vietnam veterans. The

study showed that for this group of **veterans**, service in Vietnam did not increase the risk of **developing** this type of cancer. The VA's Office of **Environmental** Epidemiology worked with the VA's Pathology Service and the Armed Forces Institute of Pathology on this research. The findings were published in the Journal of Occupational Medicine in December 1986.

Adipose Tissue Study (Retrospective **Study** of Dioxins and Furans in Adipose Tissue) - The VA, in cooperation with the **Environmental Protection Agency**, is in the process of performing a very detailed **analysis** of tissue specimens from approximately 200 males of the Vietnam era age group. The specimens **will be analyzed** for **2,3,7,8-TCDD** and **several** other related **dioxins** and furans to determine if service in the **military**, especially service in Vietnam, has **resulted** in increased **levels** of these compounds as compared to **civilians** of the same age group. In addition, the study **will help** to answer the concerns of many veterans regarding the relationship between **dioxin** levels in their bodies and the risk of developing health **problems**. It is anticipated that this study **will be completed** in **late 1988** or **early 1989**.

Specially **Solicited** Investigator Initiated Research - The VA is funding **several** investigator-initiated Agent Orange-related research projects. These studies are designed to increase our knowledge regarding the possible adverse health effects of exposure to Agent Orange and its dioxin contaminant. **Individual** research projects are in varying stages of completion at VA **medical** centers throughout the Nation.

Women Vietnam Veterans **Health** Study - The Consolidated Omnibus Budget Reconciliation Act of **1985**, enacted April 7, 1986, directed the VA to provide for the conduct of a scientific study of any long-term adverse health effects experienced by women who served in the Armed Forces in Vietnam. The study **will** examine health effects, which may have **resulted** from traumatic experiences during such service, from exposure during Vietnam service to phenoxy herbicides, **including** Agent Orange, to other herbicides, **chemicals**, or **environmental** hazards or from any other experience or exposure during such service. A **protocol** for the conduct of the study was prepared for the VA by its contractor, New England Research Institute. The protocol, after a review conducted by the **Congressional** Office of **Technology Assessment's** Advisory Committee, and the Science Panel of the Agent Orange Working Group, was modified in accordance with recommendations of those review groups. It is anticipated that a contract for the conduct of the the study **will be** awarded in **1989**.

Where can a veteran obtain additional Information on VA Agent Orange research and studies on related matters?

Information on these subjects can be obtained at the VA **medical** center **libraries**, from the Environmental Physicians or Agent Orange Coordinator at every VA medical center, or from the Environmental Medicine Office (**10B/A0**), Veterans Administration Central Office, **810** Vermont Avenue, N.W. Washington, D.C. 20420.

# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

No. 11

October 1988

## AGENT ORANGE AND RELATED RESEARCH

### NON-VA EFFORTS

CDC **Epidemiological Study (Epidemiologic Studies of the Health of Vietnam Veterans - Mandated by Public Law 97-72 and Public Law 96-151) - This project is actually three studies:** the Vietnam Experience Study, designed to evaluate the **overall** impact of military service in Vietnam on those who served there; the Agent Orange Exposure Study, intended to assess the possible adverse health effects on Vietnam veterans of exposure to the herbicide; and the **Selected Cancers Study**, designed to determine the risks of **developing** specific types of cancer among Vietnam veterans. The Veterans Administration is **providing full funding** to the Centers for Disease Control for this research.

Vietnam Experience Study - There are two components of this study: **mortality (death) and morbidity (disease)**. The **mortality** effort (Postservice Mortality Among Vietnam Veterans) revealed that total mortality in Vietnam veterans was **17%** higher than for other veterans. The excess mortality occurred mainly in the first five years after discharge from active duty and involved motor vehicle accidents, suicide, homicide, and **accidental** poisonings. Thereafter, mortality among Vietnam veterans was similar to that of other Vietnam-era veterans, except for **drug-related** deaths, which continued to be **elevated**. An unexpected finding was a deficit in deaths from diseases of the circulatory system among Vietnam veterans. The excess in **postservice** mortality due to **external** causes among Vietnam veterans is similar to that found among men returning from combat areas after World War II and the Korean War. The results of this study component were published in the **Journal** of the American Medical Association in February 1987.

The morbidity component of the Vietnam Experience **Study** (Health Status of Vietnam Veterans) indicated that the Vietnam and non-Vietnam veterans studied were **similar** in terms of level of education, employment, income, **marital** status, and satisfaction with personal relationships. Certain psychological problems, however, were **significantly** more common among Vietnam veterans than among non-Vietnam veterans. These **included** depression, anxiety, and **alcohol** abuse or dependence. About 15% of Vietnam veterans suffered from **combat-related** post-traumatic stress disorder at some time during or after military **service**, and 2.2% had the disorder during the month before the examination. During the telephone

interview, Vietnam veterans reported current and past **health problems** more often than did non-Vietnam veterans, **although** results of **medical** examinations showed few current differences in physical health between the Vietnam veterans and non-Vietnam veterans groups. The Vietnam veterans had more hearing loss. Also, among a **subsample** of participants who had semen samples evaluated, Vietnam veterans had lower sperm concentrations and **lower** average proportions of "normal" sperm **cells**. Despite differences in sperm characteristics, Vietnam and non-Vietnam veterans have fathered **similar** numbers of **children**. Children of **Vietnam** veterans were not more likely to have birth defects recorded on **hospital** birth records than were **children** of non-Vietnam veterans. The rates of total, major, minor, and suspected defects were similar among children of Vietnam and non-Vietnam veterans. The results of the morbidity component were **published** in the **Journal** of the American **Medical** Association in May 1988.

Agent Orange Exposure Study - **This** study was designed to **evaluate** the **health effects** of possible **exposure** to herbicides (**primarily** Agent Orange), utilizing information contained in military records. This component was put on hold in January **1986** because of **problems** related to the exposure assessment of veterans who served in Vietnam. More specifically, it was determined that a study based **solely** on military records was not **possible** because of the considerable **potential** for **misclassification** of exposure status. **Subsequently**, the Centers for Disease **Control** conducted a TCDD validation study to compare **military** records-based estimates with current serum **dioxin levels**. The results of this study led the Domestic **Policy Council's** Agent Orange Working Group and the **Congressional** Office of Technology Assessment to conclude that the Agent Orange Exposure Study cannot be conducted. Consequently, this study component was cancelled.

Selected Cancers Study - This study was designed to **determine** if Vietnam veterans are at **increased** risk of contracting any of five specific cancers: soft **tissue** sarcoma, **lymphoma**, nasal, **nasopharyngeal**, and **liver** cancer. Data **collection** for this study component began in January **1985** and will continue through **mid-1989**. **Publication** of the Selected Cancers Study **findings** is **currently** targeted for mid-1990.

Questions concerning the conduct of the **studies** described above **should** be referred to the Centers for Disease Control, Atlanta, Georgia 30333.

Air Force Health Study (An Epidemiologic Investigation of Health Effects in Air Force Personnel Following Exposure to Herbicides) - This study is being conducted to determine **whether** long-term adverse health effects exist following contact with herbicides and whether these **medical** problems can be attributed to **occupational** exposure to Agent Orange. The study consists of mortality and morbidity components, with follow-up efforts. The **investigation** focuses on the Air Force **personnel** attached to Operation Ranch Hand, responsible for the great majority of herbicide **spraying** missions. Members of the Ranch Hand unit had frequent and repeated exposure to Agent Orange. Individuals in the comparison group had served in numerous **flying organizations** that transported cargo **to**, **from**, and within Vietnam but were not involved in the aerial spray

operations of Agent Orange. Air Force investigators have issued a series of mortality and morbidity assessments. The **mortality** assessments have shown that the Ranch Hand **population** is doing about the same as the comparison group, with no **unusual** causes of death, increased frequency of death, or evidence suggesting death at younger ages. Because of the "healthy veteran effect," (that is, only healthy **people** are **allowed** to serve in our Armed Forces) both groups are surviving significantly longer than similarly aged civilians. The morbidity assessments showed **only** minor differences between the Ranch Hands and the comparisons, and these differences were not considered to be indicators of **dioxin-related** disease. Within the next year, investigators plan to issue the second **follow-up** morbidity report, additional **annual** mortality reports, and an expanded birth defects study.

CDC Birth Defects Study (Vietnam Veterans' Risks for Fathering Babies with Birth Defects) - This study, conducted by the Centers for Disease Control with funding from the Veterans Administration, Department of Defense, and the Department of Health and Human Services, assessed Vietnam **veterans'** risks for fathering babies with major structural birth defects. Information regarding **military** service in Vietnam was obtained from interviews with mothers and fathers of babies in case and control groups and from review of military records. Vietnam veterans did not have an increased risk of fathering babies with defects. Vietnam veterans who had greater estimated opportunities for Agent Orange exposure were not at greater risk for fathering babies with **all** types of defects combined. The study results were published in the Journal of the American **Medical** Association in August 1984.

**Agricultural** Herbicide Use and Risk of **Lymphoma** and Soft-Tissue **Sarcoma** - This population-based case-control study of soft-tissue **sarcoma**, **Hodgkin's** disease, and **non-Hodgkin's lymphoma** in Kansas found farm herbicide use to be associated with **non-Hodgkin's lymphoma**. This National Cancer Institute study indicated that the **relative** risk of **non-Hodgkin's** increased **significantly** with number of days of herbicide exposure per year and **latency**. Men exposed to herbicides more than 20 days per year (**regardless** of the number of years of herbicide use) had a 6 fold increased risk of **non-Hodgkin's lymphoma** relative to nonfarmers. Excesses were associated with the use of certain herbicides, **specifically** **2,4-dichlorophenoxyacetic acid (2,4-D)**, one of the ingredients of Agent Orange. Soft tissue sarcomas was not associated with herbicide exposure. This study supports findings from Sweden and the U.S. that suggests non-Hodgkin's lymphoma is associated with farm herbicide use. The results of the study were published in the Journal of the American **Medical** Association in September 1986.

**Soft Tissue Sarcoma and Non-Hodgkin's Lymphoma in Relation to Phenoxyherbicide and Chlorinated Phenol Exposure in Western Washington** - This National cancer institute-funded **population-based case-control** study was conducted in western Washington State to evaluate the **relationship** between **occupational** exposure of men aged 20-79 to certain herbicides and other **chemicals** and the risks of developing soft tissue sarcoma and non-Hodgkin's **lymphoma**. Occupational histories and other information were obtained by personal interviews for 128 soft tissue sarcoma **cases**

and 576 non-Hodgkin's lymphoma cases, diagnosed between 1981 and 1984, for 694 randomly selected controls without cancer. The results demonstrated small but significantly increased risks of developing non-Hodgkin's lymphoma in association with some occupational activities where certain herbicides have been used in combination with other types of chemicals, particularly for prolonged periods. They do not demonstrate a positive association between increased cancer risks and exposure to any specific herbicide alone. Moreover, these findings provide no evidence of increased risks of developing non-Hodgkin's lymphoma associated with chlorinated phenol exposure or of developing soft tissue sarcoma associated with exposure to either class of chemical. The results were published in the Journal of the National Cancer Institute in May 1987.

In addition to the scientific investigations described above, the Department of Agriculture, Environmental Protection Agency, Armed Forces Institute of Pathology, National Cancer Institute, National Institute for Occupational Safety and Health, and several other Federal agencies are doing or have completed research to discover more about the possible adverse health effects of exposure to Agent Orange and other herbicides used in Vietnam. According to a special report issued by the Domestic Policy Council's Agent Orange Working Group in September 1987, there are 70 ongoing projects and 80 completed projects. The report indicates that over \$91 million has been spent on the completed projects, an additional \$120 has been spent on the ongoing projects.

A number of States have also conducted research on Agent Orange and Vietnam veterans. Mortality studies of Vietnam veterans were completed in New York, Wisconsin, West Virginia, and Massachusetts. Studies and/or surveys have also been done in Iowa, New Jersey, and several other States.

The Veterans Administration also is closely monitoring research being conducted in other countries.

Where can a veteran get more information about Agent Orange research and studies on related matters?

Information on these subjects can be obtained at the VA medical center libraries, from the Environmental Physician or Agent Orange Coordinator at every VA medical center, or from the Environmental Medicine Office, (10B/AO), Veterans Administration Central Office, 810 Vermont Avenue, N.W., Washington, D.C. 20420.

# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

No. 12

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## AGENT ORANGE AND NON-HODGKIN'S LYMPHOMA

What is **non-Hodgkin's** lymphoma?

The term "**non-Hodgkin's lymphoma**" is used to describe a group of malignant tumors that affect the **lymph** glands and other **lymphatic** tissue. These tumors are **relatively** rare (about 3% of all cancers that occur among the U.S. general **population**), and **although survival** has improved during the past 15 years, these diseases tend to be **fatal**.

Why are Vietnam veterans concerned about **non-Hodgkin's lymphoma**?

The **possibility** that exposure to phenoxy acid herbicides such as Agent Orange may have caused rare forms of cancer in humans was suggested in Swedish studies **published** in 1979 and 1981. Investigations in Sweden reported a **six-fold** increased risk of **malignant** lymphoma (Hodgkin's Disease and **non-Hodgkin's lymphoma** combined) among persons **occupationally** exposed to phenoxy acids or chlorophenols compared to persons without exposure.

Have more recent results supported or **conflicted** with these Swedish studies?

An **analysis** using the New Zealand Cancer registry indicated an elevated risk of malignant lymphoma (**including** non-Hodgkin's lymphoma, Hodgkin's Disease, and **multiple** myeloma) **linked** with **agricultural** occupations; however, further **analyses** restricted to interviews of **non-Hodgkin's** lymphoma and **control** subjects found no significant differences between **non-Hodgkin's lymphoma** cases and controls regarding their **potential** exposure to phenoxy herbicides or chlorophenols.

A population-based study in Kansas found a **6-fold** excess risk of **non-Hodgkin's** lymphoma among farmers exposed to herbicides more than 20 days per year (regardless of the number of **years** of **herbicide** use) compared to non-farmers. Excesses of **non-Hodgkin's lymphoma** in Kansas were associated primarily with the use of phenoxy acid herbicides, **specifically 2,4-D**, one of the ingredients of Agent Orange. Hodgkin's Disease was not **associated with** herbicide use in Kansas.

A study in Washington State demonstrated **small** but **significantly** increased risks of developing non-Hodgkin's lymphoma in association with some **occupational** activities where phenoxy herbicides have been used in

combination with other types of **chemicals, particularly** for long periods. The study results did not demonstrate an association between increased cancer risks and exposure to any specific phenoxy herbicide product **alone**.

A **1987** study of Swedish pesticide **applicers, 72%** of whom were exposed **also** to phenoxy herbicides, found no excess risk of **non-Hodgkin's lymphoma** or **Hodgkin's Disease**.

Conflicting results have also been seen in studies of Vietnam veterans. No significant excess mortality from **non-Hodgkin's lymphoma** was reported among New York State Vietnam veterans, Australian Vietnam veterans, U.S. Vietnam veterans in the Centers for Disease Control Vietnam Experience Study or among Air Force "Ranch Hands" who **handled** and sprayed herbicides in Vietnam. West Virginia Vietnam veterans had an excess of deaths from **Hodgkin's Disease** compared to non-Vietnam veterans. In a mortality study of U.S. Army and Marine Corps veterans, a significantly higher than expected proportion of **non-Hodgkin's lymphoma** occurred among U.S. Marine Vietnam veterans, compared to Marines who did not serve in Vietnam. However, this **elevation** was not found among the Army veterans. The conflicting evidence makes it difficult at the present time to determine whether **non-Hodgkin's lymphoma** in Vietnam veterans is **related** to military service, **particularly** in the absence of adequate information on exposures to phenoxy herbicides. Investigations are continuing.

Where can a veteran get additional information regarding **non-Hodgkin's lymphoma**?

Information on **non-Hodgkin's lymphoma** and related matters can be obtained at VA **medical** center libraries, from the Environmental Physician at every VA **medical** center, or from the Environmental Medicine Office (10B/AO), Veterans Administration **Central** Office, 810 Vermont Avenue, N.W., Washington, D.C. 20420.





# Agent Orange Brief

Prepared by the Environmental Medicine Office  
VA Central Office, Washington, DC

No. 13

October 1988

## VA PUBLICATIONS ON AGENT ORANGE AND RELATED MATTERS

Review of Literature on Herbicides, Including Phenoxy Herbicides and Associated Dioxins - This multi-volume document is **primarily** designed for use by researchers, physicians, scientists, and others with **similar** backgrounds. The **initial** review was mandated by Public Law **96-151** in December **1979**. The first two **volumes** were released in 1981. Updates (in two volume sets) were issued in 1984 and each year thereafter.

Volume I	<b>Analysis</b> of Literature GPO Stock No. <b>051-000-00154-1</b>	\$9.00
Volume II	Annotated Bibliography GPO Stock No. <b>051-000-00155-9</b>	\$9.50
Volume III	<b>Analysis</b> of Literature GPO Stock No. <b>051-000-0164-8</b>	\$9.50
Volume IV	Annotated <b>Bibliography</b> GPO Stock No. 051-000-0165-6	\$3.25
Volume V	Analysis of Literature GPO Stock No. 051-000-00-173-7	\$6.00
Volume VI	Annotated <b>Bibliography</b> GPO Stock No. <b>051-000-00-173-5</b>	\$2.75
Volumes VII and VIII	<b>Analysis</b> of Literature and Annotated Bibliography GPO Stock No. <b>051-000-00186-9</b> (combined document)	\$7.50
Volumes IX and X	Analysis of Literature and Annotated Bibliography Not <b>available</b> from GPO ( <b>combined</b> document)	
Volumes XI and XII	<b>Analysis</b> of Literature and Annotated <b>Bibliography</b> Not available from GPO (combined document)	

Synopsis of Scientific Literature on Phenoxy Herbicides and Associated Dioxins - These documents summarize in non-technical language the **literature** reviews cited above. Number 1 in the synopsis series corresponds with Volumes I - IV of the **literature** review; Number 2 with **Volumes** V - VI; Number 3 with Volumes VII - VIII; Number 4 with **Volumes** IX - X, and Number 5 with **Volumes** XI - XII.

Monographs - The Veterans Administration Agent Orange Projects Office (now known as the **Environmental Medicine Office**) has published several technical documents of interest to individuals concerned about the use of herbicides in Vietnam:

**Cacodylic Acid: Agricultural Uses, Biologic Effects, and Environmental Fate** by Ronald D. Hood, Ph.D. - GPO Stock No. 051-000-00177-0 - \$6.00

**Birth Defects and Genetic Counseling** by Annemarie Sommer, M.D.

**Human Exposure to Phenoxy Herbicides** by Terry L. Lavy, Ph.D. - NTIS Accession NO. PB 88231857 - \$19.95

To purchase items with GPO stock numbers, write to the Superintendent of Documents, United States Government Printing Office, Washington, D.C. 20402. To purchase the monograph with the NTIS accession number, write to the U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161. The **Environmental Medicine Office (10B/A0)**, Veterans Administration Central Office, 810 Vermont Avenue, N.W., Washington, D.C. 20420, has a limited supply of most of these documents. These items are also maintained in all VA medical center libraries.

Agent Orange Review - This newsletter is prepared by the VA's Office of Public Affairs in Washington, D.C. The "Review" is published periodically to provide information on Agent Orange to concerned veterans and their families. The most recent issue (Volume 6, Number 1) of this newsletter was distributed in October 1988. That issue updates Federal government studies and activities related to Agent Orange and the Vietnam experience. Anyone interested in getting a copy of that issue should contact the Agent Orange Coordinator at the nearest VA medical center or the VA's Office of Public Affairs (003F), 810 Vermont Avenue, N.W., Washington, D.C. 20420.

Agent Orange Brief - The paper you are now reading is one of a series of one-to-four page fact sheets, prepared by the VA's Environmental Medicine Office, to help answer questions about Agent Orange and related matters. The series will be updated on a regular basis. The Agent Orange Coordinator at all VA medical centers has copies of all Agent Orange Briefs. Questions or ideas concerning these fact sheets should be directed to the Environmental Medicine Office (10B/A0), Veterans Administration Central Office, 810 Vermont Avenue, N.W., Washington, D.C. 20420.