

Polychlorinated Biphenyl Exposure and Human Disease

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Polychlorinated biphenyls (PCBs) continue to be of great environmental and occupational health interest. This review summarizes the major clinical findings reported in individuals incurring the greatest PCB exposure—those persons working in the manufacture or repair of electrical capacitors or transformers. The potential target organs addressed in the studies reviewed include the liver, lungs, skin, cardiovascular system, nervous system, certain endocrine systems, the blood/immune system, and the gastrointestinal and urinary tracts. After careful analysis, the weight of evidence suggests the only adverse health effects attributable to high, occupational PCB exposures are dermal. This review confirms and extends the observations of others, ie, that the collective occupational experience with PCB fluids provides no evidence for adverse PCB effects on any other organ systems.



ToxFAQs

Polychlorinated Biphenyls (PCBs)

CAS# 1336-36-3

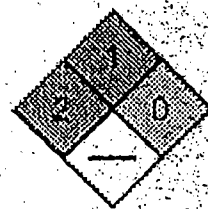
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Octachlorobiphenyl

$C_{12}H_2Cl_8$

Stereo Image

XYZ File



NFPA Label Key

Agency for Toxic Substances and Disease Registry

Is there a medical test to show whether I've been exposed to PCBs?

There are tests to find out if PCBs are in your blood, body fat, and breast milk. Blood tests are probably the easiest, safest, and best method for detecting recent exposures to large amounts of PCBs.

However, since all people in the industrial countries have some PCBs in their bodies, these tests can only show if you have been exposed to higher-than-normal levels of PCBs. However, these measurements cannot determine the exact amount or type of PCBs you have been exposed to or how long you have been exposed. In addition, they cannot predict whether you will experience any harmful health effects.

DSW 189780

STLCOPCB4042080

BACKGROUND BLOOD OR PLASMA PCB CONCENTRATIONS IN THE GENERAL POPULATION OF THE UNITED STATES

STUDY	NUMBER OF SUBJECTS	YEAR MEASURED	REPORTED RANGE (ppb)
Finklea, et al., 1972	616	1968	0-29
Humphrey, 1976	16	1973	7-42
Humphrey, 1983	29	1973	Less than 5-41
Baker, et al., 1980	110	1977	6-79
Smith, et al., 1982	22	1977	15-77
Kreiss, et al., 1982	1631	1977	Less than 1-57
Smith, et al., 1982	32	1977	2-78
Chase, et al., 1982	19	1979	10-27
Emmett, 1985	54	1979	1-15
Kreiss, 1985 (Drotman, 1981)	17	1979	2-30
Kreiss, 1985	105	1979	Less than 5
Fait, et al., 1987	56	1979	8.2-24.4
Emmett, et al., 1988a	56	1979	0-15
Fait, et al., 1989	56	1979	0-15
Kreiss, 1985	10	1980	1-18
Kreiss, 1985 (Humphrey, 1983)	418	1980	Less than 3-60
Smith, 1983	73	1981	1.3-14.9
Kreiss, 1985 (Reid & Fox, 1983)	138	1981	Less than 3-43
Fitzgerald, et al., 1986	341	1981	1-21
MDPH, 1987	840	1982	0.4-154
Kreiss, 1985 (Welty, 1983)	40	1983	1-23
Kreiss, 1985 (Condon, 1983)	990	1983	2-30
Kreiss, 1985 (Welty, 1983)	59	1983	1-45
Christiani, et al., 1986	17	1983	1-20
Sahl, et al., 1985a,b	738	1984	Less than 1-37
Brandt-Rauf & Niman, 1988	16	1986	0.3-22
Hosek, 1988	32	1986	1-9
Hartle & Albrecht, 1987	30	1987	1.1-9.66
Mortensen, et al., 1987	66	1987	Less than 1-24
Singal & Roper, 1988	36	1987	2-106

SERUM PCB CONCENTRATIONS IN U.S. POPULATIONS WITH OCCUPATIONAL EXPOSURE, ng/mL

LOCATION	EXPOSURE	NUMBER OF SUBJECTS	YEAR	ARITHMETIC (GEOMETRIC) MEAN	RANGE	REFERENCE
Michigan	silos farmers	149	1977	28	5-300	Humphrey(1983)
Bloomington, IN	capacitor plant	7	1976	98.4	36-286	Levy(1977)
Hudson Falls, NY	capacitor plant	194	1976	(393)	63-2410	Lawton(1985)
Upstate NY	capacitor plants (2)	290	1976	172	7-3076	Fischbein(1979); Wolff(1982)
Bloomington, IN	capacitor plant	18	1977	75.1	16-357	Baker(1980); McCloskey(1978)
Bloomington, IN	capacitor plant	221	1977	(144)	1-3580	Smith(1982)
Bloomington, IN	capacitor plant	5	1977	180.8	65-366	Steele(1986)
Midwestern US	private utility	25	1977	51	16-298	Smith(1982)
Western US	public utility	14	1977	38	12-76	Smith(1982)
Billings, MT	packing house	17	1979	6.4	4-11	Apol(1980)
Hudson Falls, NY	capacitor plant	194	1979	(87)	16-500	Lawton(1985)
Upstate NY	capacitor plants (2)	147	1979	(302)	---	Taylor(1989)
Washington, DC	switchgear shop	37	1979	26.5	1-300	Fait(1989)PC
Washington, DC	switchgear shop	35	1979	53.7	4.3-253	Fait(1989)FSC
Washington, DC	switchgear shop	54	1979	(9.7)	1-300	Emmett(1985, 1988); Moseley(1984)
Washington, DC	switchgear shop	37	1979	(12.2)	1-300	Emmett(1985, 1988)Moseley(1984)
Wilmington, DE	railroad	86	1979	33.4	10-312	Chase(1982)
Wilmington, DE	railroad	15	1979	14.2	10-30	Chase(1982)
San Francisco, CA	utility	15	1980	43.2	21-70	Pryor(1984)
Decatur, IL	PCB cleanup	20	1981	8.9	2.5-36	Boxer(1982)
Mentor, OH	electrical service	16	1981	58	25-127	Kominsky(1983)
Brunswick, GA	electrical service	6	1982	5.9	<3-25.2	Williams(1983)
New Bedford, MA	capacitor plant	205	1982	(18.2)	0-424	Acquavella(1986)
Cambridge Springs, PA	utility	5	1983	14	8.2-25.2	Tirpak(1988)
Massachusetts	gear plant	38	1983	14.4	3-97	Christiani(1986)
Perth Amboy, NJ	chemical plant	32	1983	6.5	---	Cummings(1985)
Perth Amboy, NJ	chemical plant	18	1983	11.7	---	Cummings(1985)
Syracuse, NY	utility	12	1983	9.7	7-31.1	Stark(1986)
Bloomington, IN	capacitor plant	10	1984	(27.7)	3-75	Stehr-Green(1986)
New York, NY	municipal	16	1986	3.5	0.3-22.2	Brandt-Rauf(1988)
Tulsa, OK	utility	29	1986	7.8	2-31	Hosek(1988)
El Dorado, AK	PCB incineration	45	1987	102	5-385	Singal(1988)

SUMMARY BLOOD LEVEL RANGES

GENERAL POPULATION

ND TO 20 OR 30 ppb

WORKER POPULATIONS

UP TO 3500 ppb

DSW 189783

ANNISTON RESIDENTS ADPH RESULTS

	<u># PERSONS</u>
LESS THAN 20 ppb	75
20-39 ppb	15
GREATER THAN 40 ppb	<u>13</u>
TOTAL TESTED	103

RANGE: NONE DETECTED - 303 ppb

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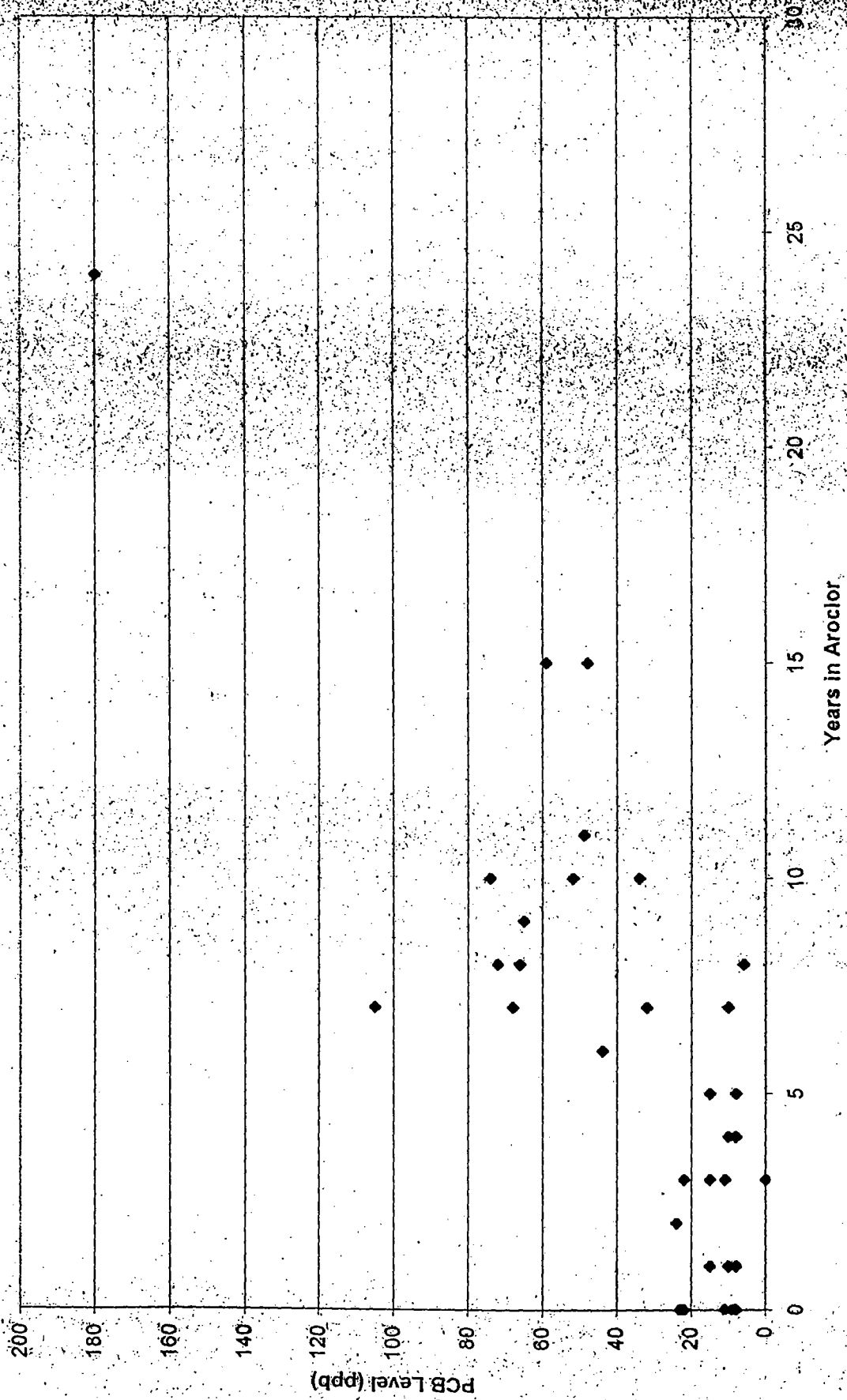
MONSANTO EMPLOYEES/RETIREEES RESULTS

	<u># PERSONS</u>
LESS THAN 20 ppb	17
20-39 ppb	6
GREATER THAN 40 ppb	<u>12</u>
TOTAL TESTED	35

RANGE: NONE DETECTED - 180 ppb

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PCB Level vs. Years in Aroclor



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