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# A RICIN PRIMER <sup>1</sup>

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**A White Paper**

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(1) Based on documentation from the Centers for Disease Control (CDC), the Department of Homeland Security (DHS), and major news sources.

## What is ricin?

- Ricin is a poison found naturally in castor beans. It is about 6000 times more toxic than cyanide and is readily made from the waste meal left after processing castor beans for castor oil. As little as 500 micrograms of the toxin – an amount the size of the head of a pin – can kill an adult.
- It can be in the form of a powder, a mist, or a pellet, or it can be dissolved in water. Ricin is comparatively easy to make into a bioweapon, is cheap, and does not have to be highly purified to be effective.
- It is a stable substance under normal conditions.

## Ricin as a biological weapon

- Ricin is well suited as a weapon of terrorism for two reasons. Easily disseminated, it is deadly in small doses and it is easily accessible. “The technology for making it is low enough that literally any crank working in his basement can create a ricin preparation of some sort,” said Jonathan Tucker, a biological weapons expert with the Center for Nonproliferation Studies at the Monterey Institute of International Studies. “You can’t do that as easily with anthrax.”
- Ricin has been used for assassinations and small-scale attacks. In one of the most famous assassinations of the Cold War, Bulgarian secret police in 1978 used a tiny pellet of ricin, fired from a specially designed umbrella, to kill dissident Georgi Markov on a street in London.
- Ricin is not well suited as a weapon of mass destruction. At least a half-dozen countries, including the United States and Iraq, have sought to weaponize ricin. However, bioweapons scientists found they needed tons of ricin to deliver lethal doses to a battlefield.
- Also, ricin poisoning is not contagious. It cannot be spread from person to person through casual contact, minimizing its large-scale effects.
- In 1962, U.S. Patent No. 3,060,165 was issued to H.L. Craig et.al. for “Preparation of Toxic Ricin”
- In the 1940s the U.S. military experimented with using ricin as a possible warfare agent. Ricin was possibly used as a warfare agent in the 1980s in Iraq and more recently, by terrorist organizations.

## How ricin works

- Inhalation and ingestion are the important routes into the human body. Hand or eye contact will usually only lead to redness and pain of the skin and eyes.
- Ricin works by getting inside the cells of a person’s body and preventing the cells from making the proteins they need. Without the proteins, cells die. Eventually this is harmful to the whole body, and death may occur.

## Exposure symptoms

- **Inhalation:** Initial inhalation symptoms may occur within 8 hours. Likely symptoms of significant exposure would be respiratory distress (difficulty breathing), fever, cough, nausea, and tightness in the chest. Heavy sweating may follow as well as fluid building up in the lungs (pulmonary edema). This would make breathing even more difficult, and the skin might turn blue. Excess fluid in the lungs would be diagnosed by x-ray or by listening to the chest with a stethoscope. Finally, low blood pressure and respiratory failure may occur, leading to death. In cases of known exposure to ricin, people having respiratory symptoms that started within 12 hours of inhaling ricin should seek medical care.
- **Ingestion:** Following ricin ingestion, initial symptoms typically occur in less than 6 hours. Likely manifestations of significant exposure would include vomiting and diarrhea that may become bloody. Severe dehydration may be the result, followed by low blood pressure. Other signs or symptoms may include hallucinations, seizures, and blood in the urine. Within several days, the person’s liver, spleen, and kidneys might stop working, and the person could die.

## How to Monitor for Ricin

- Fluoro-immunoassay methods are usually used, as they directly target the toxin molecule.
- Nucleic acid (PCR) methods are sometimes used, but depend on the presence of castor bean DNA, which may or may not be present in a detectable form depending on processing methods used to extract toxin from the beans.
- There are no widely available, reliable medical test to confirm that a person has been exposed to ricin.

## A Chronology of Ricin Incidents

- On April 16, 2008, Roger Von Bergendorff was arrested in Las Vegas following release from a hospital where he was being treated for ricin poisoning. Detectives found in his hotel room, ricin, castor beans, syringes, beakers, an Anarchist’s Cookbook, and a collection of instructions on poisons and other dangerous recipes, including instructions on the preparation of ricin.
- On May 24, 2007, a British lab confirmed that traces of ricin had been found in an Irish prison cell. The ricin was smuggled into Ireland from the U.S. in a contact lens case, to be used in an assassination plot. An arrest was made before the ricin could be used.
- On October 3, 2006, Denys Ray Hughes of Phoenix, Arizona, was sentenced to seven years in prison for the attempted manufacture of ricin. According to authorities, Hughes was a survivalist with no known ties to any terrorist organizations or extremist groups.
- In **November 2003**, traces of ricin were found in mail bound for the White House.
- On **October 2003**, a metallic container was discovered at a Greenville, South Carolina postal facility with ricin in it. The small container was in an envelope along with a threatening note. Authorities did not believe this was a terrorism-related incident. The note expressed anger against regulations overseeing the trucking industry.
- In **March 2003**, traces of ricin were found by the police in two vials inside a locker at Gare de Lyon railway station in Paris.
- On **January 5 2003**, six Algerians were arrested at their apartment in London, United Kingdom on charges of “being in the possession of objects which give rise to reasonable suspicions of the intention of carrying out preparing, or instigating an act of terrorism” and for trying to “develop or produce a chemical weapon.” Following the arrests, authorities discovered traces of ricin in the apartment located in Wood Green, located in northern London. They also discovered castor oil beans and equipment for crushing the beans. Those arrested are believed to be part of a terrorist cell known as the “Chechen network “ which may have ties to the Algerian group behind the millennium bomb plots in the United States. Members of the cell are Algerians who received training in Chechnya and the former Soviet republic of Georgia. Authorities stated that they believe the ricin discovered was only part of a larger batch that they believe was removed from the apartment before the arrests. Police stated that they were continuing to search for the missing ricin. All but one of the suspects was acquitted of charges in April, 2005.

- In **December 2002**, 6 terrorist suspects were arrested in Manchester, England. Their apartment was serving as a “ricin laboratory.” Among them was a 27-year-old chemist who was producing the toxin.
- In **August 2002**, Reports emerged that Ansar al-Islam, a Sunni militant group, had been involved in testing poisons and chemicals including ricin. According to one report the group tested ricin powder as an aerosol on animals such as donkeys and chickens and perhaps even an unwitting human subject.
- On **19 June 2002**, Kenneth R. Olsen, 48, was arrested for possession of the biological agent ricin in his Spokane Valley office cubicle. Co-workers at Agilent, a high-tech company, tipped FBI officials about the software engineer after discovering documents on “how to kill, “ undetectable poisons, and bomb-making Olsen had printed out from his computer. Olsen insisted that his research was for a Boy Scout project, but did not say more. Further investigation of his office produced test tubes, castor beans, glass jars, and approximately 1 gram of ricin.
- In **November 2001**, recipes to make ricin were reportedly found in Al Qaeda hideouts in Kabul, Afghanistan, and traces of the substance were found at suspected Al Qaeda biological weapons sites.
- In **August 2001**, the FSB (Russian Federal Security Service) told the Itar-Tass news service it had intercepted a recorded conversation between two Chechen field commanders in which they discussed using homemade poisons against Russian troops. According to Itar-Tass, Chechen Brigadier General Rizvan Chitigov asked Chechen field commander Hizir Alhazurov, who is now living in the United Arab Emirates, for instructions on the “homemade production of poison “ for use against Russian soldiers. Russian authorities reportedly raided Chitigov's home and seized materials, including instructions on how to use toxic agents to contaminate consumer goods, a small chemical laboratory, three homemade explosives, two land mines, and 30 grenades. The confiscated papers reportedly also contained instructions on how to produce ricin from castor beans.
- On **March 2, 2000**, Larry Ford, a renowned gynecologist and infectious disease expert in Los Angeles, and putative former CIA agent, committed suicide. A search of Ford's house unearthed more than 260 containers of biological material, most of it in a refrigerator in Ford's garage, along with the jar of ricin in his family room.
- In **November 1999**, press reports indicated that FBI agents had apprehended a man in Tampa, Florida, for threatening to kill court officials and “wage biological warfare” in Jefferson County, Colorado. James Kenneth Gluck, 53, a former Colorado resident, sent a 10-page letter to Jefferson County judges threatening to kill them with a biological agent. He specifically identified one judge by name. FBI agents arrested Gluck on 5 November 1999 as he left a

public library near his home in Tampa. Police, fire, and hazardous materials (HazMat) crews responded to the scene along with the FBI and blocked off Gluck's street. Upon searching his residence the next day, agents discovered that Gluck had the necessary ingredients to make ricin, though no refined ricin was actually found. They also found test tubes and beakers, as well as the "anarchist's cookbook" and books on biological toxicology, in a makeshift laboratory in his home.

- On **August 25 1998**, Dwayne Lee Kuehl, 38, was arrested in Escanaba, Michigan, for producing ricin with intent to use it against an Escanaba city official. Kuehl was under investigation in connection with a 1 February 1988 fire that destroyed a business that he owned. While carrying out a search warrant at Kuehl's home and his rental property, police interviewed him. During the interview, Kuehl indicated that he had obtained the recipe and ingredients for the manufacture of ricin and made the poison in 1993. He also admitted that he made the ricin in order to kill James O'Toole, an Escanaba housing inspector. Police later found the ingredients for ricin manufacture, along with other toxic substances, at two separate residences owned by Kuehl.
- In **March 1998**, three members of a splinter group of the North American Militia in Michigan were arrested on weapons and conspiracy charges. The April 1998 indictment was the result of an investigation involving an Alcohol, Tobacco, and Firearms (ATF) agent who infiltrated the group in March 1997. When federal law enforcement raided the homes of these men, they discovered an arsenal of weapons and a videotape. Produced in a cooking-show format, the tape gave instructions on how to manufacture bombs and other assorted militia-type weaponry, including a feature segment on how to extract ricin from castor beans. During the court proceedings, prosecutors drew attention to the ricin segment, stating that the men were "collecting information on the manufacture and use of ricin." However, other than the videotape, no materials associated with ricin production were found in any of the raids.
- On **April 1 1997**, Internal Revenue Service (IRS) investigators searched the home of James Dalton Bell, a 39-year-old electronics engineer, and discovered a cache of chemicals, which included sodium cyanide (500 grams), diisopropyl flourophosphate, and a range of corrosive acids. Subsequent analysis of computer files confiscated from the residence revealed that Bell engaged in e-mail communications with a friend, Robert East, a 46-year-old merchant marine radio operator, that expressed a desire to obtain castor beans to see if they could extract ricin. Bell had already acquired the home addresses of nearly 100 federal employees from the Federal Bureau of Investigation (FBI), IRS, and Bureau of Alcohol, Tobacco and Firearms; and computer files from voter registration. Bell was in the process of producing and acquiring chemical and biological agents.
- On **January 17 1997**, authorities discovered various toxic substances in the house of Thomas Leahy in Janesville, Wisconsin. They discovered the substances after they had been called to Leahy's home after he had shot his son in the face,

following a night of drinking. Among the chemicals discovered were 0.67 grams of ricin and nicotine mixed with a solvent that allowed it to penetrate the skin and have lethal effects. Authorities also found books relating to the production of chemical and biological agents. Chemicals were also found in a storage shed that Leahy kept in Harvard, Illinois. He reportedly told his sister that he was going to use the poison to coat razor blades and mail them to his enemies in hopes that they would cut themselves and become infected. Leahy pleaded guilty to possession of the ricin and was sentenced to eight years for the shooting and six-and-one-half years for possessing dangerous materials.

- **On December 20 1995**, Thomas Lewis Lavy was arrested in Onia, Arkansas for possession of ricin. In April 1993, Lavy was caught while trying to smuggle 130 grams of ricin from Alaska into Canada. Lavy stated that he purchased the ricin to poison coyotes on his farm in Arkansas and keep them away from his chickens. Lavy was stopped at the Beaver Creek border crossing by Canadian custom agents who found, along with the 130 grams of ricin, \$89,000, a knife, four guns, and 20,000 rounds of ammunition. Lavy was charged with possession of a toxic substance with intent to use it as a weapon. At the time of Lavy's arrest, FBI agents found castor beans and copies of one book describing how to extract ricin from castor beans, and another discussing ways to poison people with toxic compounds. Lavy was ordered to be held until a January court date in Alaska, but committed suicide in his prison cell before the trial.
- **On August 22 1995**, Dr. Ray W. Mettetal, Jr., a 44-year-old neurologist at Rockingham Memorial Hospital in Harrisonburg, Virginia, was apprehended at Vanderbilt University Medical Center in Nashville, Tennessee, carrying a six-inch veterinarian's syringe with a four-inch needle filled with boric acid and salt water (contact lens solution), which could prove lethal if injected into the heart. He allegedly planned to use the syringe to murder Dr. George S. Allen, his former supervisor when he was a neurology resident at Vanderbilt in the 1980s. After the arrest, police searched a storage unit rented by Mettetal in Harrisonburg, Virginia, in which they found toxic chemicals and several books on assassination and producing chemical and biological agents. Also among the items was a small glass jar containing the toxin ricin, notes documenting Allen's whereabouts, maps of the campus where Allen worked, and photographs of his house. These notebooks alleged that Mettetal planned to soak pages of a book with a ricin-solvent mixture that could promote the movement of the toxin through the skin once introduced. After the ricin was discovered in his possession, a federal case was brought against Mettetal. He was also charged with the federal offense of providing false information (e.g., the false identity of Steven Ray Maupin) to the U.S. Postal Service.
- **On August 7 1995**, Michael Farrar, a 40-year-old cardiologist, was hospitalized with a mysterious illness. On two additional occasions, Farrar was hospitalized for exhibiting similar unexplained symptoms. At first, doctors believed his problems were connected to his recent trip to South America, and it was not until 25 September 1995 that ricin was considered the cause. On that day, Farrar

called police during a domestic dispute with his estranged wife, Debora Green, a 44-year-old non-practicing oncologist. The police report stated that due to her bizarre behavior, Green was taken to a psychiatric clinic that night. Finding castor beans in his wife's purse, Farrar turned the beans and sales receipt over to police. Green had purchased the castor beans through special order from a garden center in Kansas City, Missouri, and placed them in Farrar's food. It is unclear if she extracted the ricin or merely added the beans to the food. Later, Farrar had to undergo multiple heart and brain surgeries related to the poisoning.

- In **1994** and **1995**, four Minnesota men were the first to be tried and convicted under the 1989 Biological Weapons Anti-Terrorism Act, for the possession of ricin – a potent biological toxin. Douglas Baker, Leroy Wheeler, Dennis Henderson, and Richard Oelrich acquired this deadly substance in an alleged plot to kill local deputy sheriffs, U.S. marshals, and IRS agents. The four men were members of a radical tax-protesting militia organization called the Minnesota Patriots Council. The Minnesota Patriots Council was founded by Col. (Ret) Frank Nelson of the United States Air Force in 1970. The right-wing organization opposed the notion of a federal government and refused to recognize any authority above the local county. Its members protested U.S. taxation policies and met periodically in small groups, or cells. In 1991, Oelrich, Henderson, and Wheeler came across a classified notice in a right-wing publication advertising a mail order ricin kit. The three ordered the ricin kit in April 1991 and intended to mix the ricin with chemicals in order to create an effective delivery system. In early 1992, Henderson took the mixture containing ricin to his friend Douglas Baker's house, where it was stored in a coffee can along with a cautionary note. Following a marital dispute, Baker's wife, Colette, took the coffee can along with several other weapons to the local sheriff's office, which in turn contacted the FBI. It was determined that the coffee can contained 0.7 grams of ricin that was reportedly capable of killing hundreds of people. Baker and Wheeler were arrested on 4 August 1994, and stood trial for the possession of a deadly biological substance at the Federal District Court in St. Paul, Minnesota. The two received two-year-and-nine-months prison terms followed by three-year probationary periods. Henderson and Oelrich were arrested in July and August of 1995, respectively. The two had fled and gone underground upon the news of their co-conspirators' arrests. They stood trial in October and were also convicted of producing and possessing the poisonous substance. In January 1996, Henderson was sentenced to 48 months in prison followed by three years of probation, and Oelrich received a 37-month prison term and three years of probation.
- In **1983**, Montgomery Todd Meeks, 19, was tried for attempting to murder his father with ricin. He claimed that the act was motivated by his father's abuse. He conducted research on poisons, decided on ricin, and then purchased the material from Aardvark Enterprises in Louisville, Kentucky, for \$200. A classmate went to Kentucky to pick up the purchase, but emptied the vial of ricin into a toilet when he returned to Orlando International Airport. It was alleged

that Meeks continued with the murder plan and ceased only when a friend went to the police.

- In **1983**, two brothers were arrested by the FBI for producing an ounce of pure ricin, which they stored in a 35-mm canister. Officials were directed to the brothers after receiving a tip from an informant. The FBI took the material to the U.S. Army laboratories at Ft. Detrick where it was destroyed.
- In **1982** Texas attorney William A. Chanslor, 50, was sentenced to jail for three years and fined \$5,000 for plotting to kill his 39-year-old wife with ricin. He claims that he wanted the ricin to assist his wife in committing suicide. She was paralyzed after having a stroke in 1979. She begged the jury not to convict Chanslor. He put ads in two paramilitary magazines, *Soldier of Fortune* and *Gung Ho*. His ads said, “Wanted: experts in poisons and chemical agents with access to same.” He also read at least one book that included information on the toxin. When Chanslor contacted the author of a book on toxins, regarding the acquisition of ricin, the author contacted Canadian law enforcement officials. Police then recorded a meeting between the two where Chanslor purchased a tablet supposedly containing ricin for \$2,500. On 4 August 1982, facing a penalty of 20 years in prison, Chanslor was sentenced to three years in prison and fined \$5,000.
- In **1978**, Bulgarian dissident Georgii Markov was assassinated with ricin toxin by an operative of the Bulgarian secret service.