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Designer Drugs, China White, and the Story of MPTP

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NOTE: The original 1,000+ page manuscript for *Slaying the Dragon: The History of Addiction Treatment and Recovery in America* had to be cut by more than half before its first publication in 1998. This is an edited excerpt that was deleted from the original manuscript.

"Designer drugs"--a term coined by pharmacologist Gary Henderson, of the University of California--represent efforts by chemists to alter the molecular structure of a psychoactive drug to change the drug identity while maintaining or intensifying the original drug's psychoactive properties. Designer drugs are often analogues--chemical cousins--of the drugs they're modeled after and may have effects and risks quite different than these original substances. The primary reason people created such chemical cousins was that they were legal to possess and sell before new legislation was passed in 1986 that rendered these analogues illegal. Before 1986, persons arrested with these substances could not be prosecuted because the substances were not explicitly prohibited in state and federal drug laws. These drugs were also not detected through routine blood and urine testing procedures. Over the years the term "designer drug" has been broadened to refer to an illicitly manufactured synthetic drug.

The modern story of designer drugs begins in 1976 with Barry, a bright, twenty-three-year-old college student from Bethesda, Maryland. Barry created an analogue of meperidine (Demerol)--MPPP, that was not legally controlled as a way to avoid contact with the illicit drug market. He continued to synthesize and use MPPP for six months without incident. In the summer of 1976, he made a new batch of MPPP but through a mistake in the synthesis procedure produced not MPPP, but a highly potent neurotoxin--MPTP. Following ingestion of MPTP, the young college student suffered partial paralysis, muscle spasms.tremors, slowness of movement, a masklike face and a loss of speech. He had, in short, developed what appeared to be the classic symptoms of Parkinson's disease. The contaminant MPTP had destroyed his brain's dopamine-producing cells. While medical treatment controlled some of the worst of the symptoms, Barry's Parkinson's continued unabated. Becoming increasingly depressed about his condition, Barry sat

under a shade tree on the grounds of the National Institute of Health in the fall of 1978 and killed himself with an overdose of cocaine. His story, briefly outlined in a 1979 article in Psychiatric Research, might have been easily lost to history if it were not for future developments (McCormick, 1989; Restak, 1994).

In 1979 two California men were found dead with fresh needle tracks and drug injection paraphernalia and white powder found close to their bodies. The Drug Enforcement Agency's Washington lab identified the powder as a designer narcotic. Deaths from "synthetic heroin" continued to be reported through 1980 and 1981. Then in the summer of 1982 a completely new chapter of this story unfolded in Southern California.

Following the Fourth of July weekend, neurologist Dr. J. William Langston treated a forty year old patient brought to Santa Clara Valley Medical Center. The patient had even more severe symptoms than those those described above in our young college student. Langston's patient was frozen into immobility and speechlessness, appearing more like a marble sculpture than a human being. A week later, the girlfriend of Langston's patient experienced the same extreme symptoms. Dr. Langston was baffled by symptoms that looked like Parkinson's disease but which came on too quickly and at too young an age to fit that diagnosis. Within three weeks, Langston had identified six drug users with what appeared to be advanced Parkinson's disease. But this was an impossible diagnosis.

The answer to this medical riddle was found when someone remembered an article on a drug-using college student who had experienced similar symptoms. Analysis of the drugs Langston's patients had used confirmed the presence of MPTP--obtained in heroin sold under the brandname of "China White" (McCormick, 1989). Langston determined that the MPTP, created through mistakes in the synthesis of the desired MPPP, interacted with a naturally occurring brain enzyme as it was metabolized, producing the substance MPPP inside the body. This latter substance virtually destroys a small area of the base of the brain called the substantia nigra. It is in this small region that the brain produces dopamine, a neurotransmitter essential for normal human functioning. The brains of Dr. Langston's frozen patients had, through their absence of dopamine, lost their capacity to convert thought into action. This error in street chemistry had produced a product that could by-pass all the brains protective systems. MPPP, itself non-toxic, passed into the brain as what Langston called a chemical Trojan Horse where natural occurring brain enzymes converted MPTP into MPPP, one of the most powerful neurotoxins ever discovered (Langston and Palfreman, 1996).

Langston's frozen addicts responded to the medication L-Dopa, but experienced many of the problematic side effects that some Parkinson's patients experience who are maintained on the drug--periods where the medicine fails to work, confusion, hallucinations, and paranoia.

Langston's analysis of this phenomenon of "frozen addicts" included a dire warning: in some users, the MPTP may have only partially damaged the substantia nigra which would not reveal active symptoms now but would reveal those symtpoms later through the aging process. In short, some users could already have set a course that would unfold the early onset of Parkinson's disease in coming years. In perhaps a touch of poetic justice, the individual who manufactured the China White that Langston's six addicts used with such disastrous results, himself later consulted Langston about early signs of Parkinson's disease (Langston and Palfreman, 1996, Shafer, 1985).

New substances entering the illicit drug market in the 1970s that required a higher level of skill to produce. Mistakes in the preparation of these substances often brought ominous results. One substance that followed MPPP was another Demerol cousin--PEPAOP which sometimes included a contaminant PEPTP, which was linked to chemically induced Huntington's Chorea (Kirsch, 1986). The DEA, used its emergency powers, designated MPP and

PEPAOP as Schedule I drugs in August, 1985. This loophole was permanently addressed with passage of the Federal Analogue Act of 1986.

The above mistakes in chemical synthesis signaled the introduction of fentanyl analogues into the illicit drug supply. Fentanyl is a synthetic narcotic introduced into American medicine as Sublimaze in 1972. It is widely used in surgery to produce short-term anesthesia. Its availability and potency have linked it to the dramatic rise in addiction among anesthesiologists and nurse anesthetists in the U.S. This addiction rate has promoted concern by medical associations and institutions and promoted experts like Dr. David Smith to refer to addiction as an "occupational hazard" of anesthesiology.

While there was early evidence of misuse of fentanyl by medical personnel, fentanyl was not expected to be a candidate for illicit diversion because of its short duration of effect. According to pharmacologist Gary Henderson, this problem was solved in 1979 when a "phantom chemist" created two fentanyl analogues that were longer acting. These analogues--alpha-methyl fentanyl and 3-methyl fentanyl--approach the duration of effect of heroin. (Gallagher, 1986). The potency of the more than 200 known fentanyl analogues is also quite remarkable. The two most common analogues named above are, respectively, 200 and 1,000 times more potent than morphine.

Fentanyl analogues appeared within the illicit drug culture as early as December 1979, and, by 1981, treatment centers were encountering heroin addicts entering treatment whose urine samples did not test positive for opiates. It was later confirmed that these clients had been using "China White" or other products sold as "synthetic heroin." Anecdotal reports within the drug culture during this period that fentanyl analogues were not being detected by conventional drug testing procedures enhanced the attractiveness of these products to opiate users who were being subjected to routine drug testing.

Use of designer opiates increased during the mid-1980s. Kirsch reported in 1986 that 10% of clients in Northern California methadone clinics tested positive for fentanyl derivatives when special tested for fentanyl were administered for all incoming clients. The number of cases of MPTP-induced Parkinson's disease also rose. By 1985, the Center of Disease Control had identified 400 MPTP exposed individuals. These individuals presented with symptoms such lost or impaired speech, impaired mobility (slow, stooped gait), stiffness, and tremors. The CDC also reported more than 100 deaths related to designer opiates (Kirsch, 1986). Some of the fentanyl overdose deaths were caused by synergistic interaction between fentanyl analogues and other drugs, particularly cocaine and alcohol.

Designer drugs are the latest stage of evolution in the Twentieth Century's major contribution to the history of addiction: the laboratory synthesis of new psychoactive drugs that require no plant-based materials. Dr. Richard Restak, in his review of designer drugs, also pointed out that their history underscores the thin line between benefit and injury and that the smallest modification in a drugs structure can "unleash powerful unintended forces." (Restak, 1994, p. 115). To the reader wondering, how illicit chemists would know how to manufacture various drugs, one need only point out the ready availability of manuals such as The Construction and Operation of Clandestine Drug Laboratories and The Whole Drug Manufacturers Catalog that provided a list of equipment and chemicals required and step by step instructions to synthesize various psychoactive drugs (Siegel, 1989, p. 285), to say nothing about the subsequent availability of such information on the Internet.

References

Gallagher, W. (1986). The looming menace of designer drugs. *Discover*, August, pp. 24-35.

Kirsch, M. (1986). *Designer drugs*. Minneapolis, Minnesota: CompCare Publications.

Langston, J. W. & Palfreman, J. (1996). *The case of the frozen addicts*. NY: Vintage Books.

McCormick, M. (1989). *Designer drug abuse*. NY: Franklin Watts.

Restak, R. (1994). *Receptors.* NY: Bantam Books.

Shafer, J. (1985). Designer drugs. *Science*, March, pp. 60-67.

Siegel, R. (1989). *Intoxication: Life in pursuit of artificial paradise*. NY: E.P. Dutton.