A black and white portrait of Elvis Presley, looking slightly to the right with a serious expression. He has his signature pompadour hairstyle and is wearing a dark jacket over a light-colored collared shirt.

Elvis Presley: Head Trauma, Autoimmunity, Pain, and Early Death

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In the spring of 1981, I was working in my West Covina office when my secretary said an attorney wanted to talk with me about a case. “Dr. Tennant, I’m James Neal. I’m an attorney in Tennessee and I’m defending Dr. George Nichopoulos [Dr. Nick], Elvis Presley’s doctor. Incidentally, if my name doesn’t ring a bell, I’m the lawyer who prosecuted Richard Nixon in the Watergate Trial.” The call itself wasn’t all that unexpected; a few months earlier, I had appeared on behalf of the US government in the trial against the physician of Howard Hughes. In those years, I was one of the only physicians who was studying opioids for both pain and addiction, and I did a lot of forensic and legal testimony.¹⁻³

I accepted Mr. Neal’s offer to review Dr. Nick’s case, and soon found myself embedded in a study of Elvis’ drug addiction, pain, and medical problems. At the time, the public issue and controversy was centering on Elvis’ drug use, and whether he died of a heart attack or drug overdose. There was little interest in his underlying medical problems, pain, or why he died at the relatively young age of 42. Dr. Nick was being criminally charged with murder because he had been the main physician prescribing medications to Elvis.

Mr. Neal and his law firm provided me with a trove of documents about Elvis’ medical history including: Dr. Nick’s medical records, hospitalization records, autopsy report, prescription records, and a confidential 161-page private investigation of Elvis’ medical and drug history crafted by Mr. Neal and his law firm. I agreed to be a defense witness at Dr. Nick’s Memphis, Tennessee, criminal trial in October 1981. The jury sided with me, and cleared Dr. Nick of criminal charges. They found that Dr. Nick was a fine physician who took care of Elvis for more than 10 years.

Although I accomplished my mission, the mystery of Elvis’ myriad medical problems and early death has mystified me ever since. For starters, it appears that Elvis Presley was quite well until approximately the last 10 years of his life. In the last 3 years of his life, Elvis was so ill and disabled he required around-the-clock nursing care. After Dr. Nick’s trial, I carefully stored all of my records knowing that someday science would pony-up enough information to permit an understanding of Elvis’ medical and pain problems. I believe that day has come.

Progress in modern pain management finally has provided us with enough scientific knowledge about traumatic brain injury (TBI), autoimmune disease, and pain to unravel his medical history. After piecing the evidence together, it is quite clear to me that Elvis’ major disabling medical problems stemmed from multiple head injuries that led to an autoimmune inflammatory disorder with subsequent central pain. His terminal event was cardiac arrhythmia, underpinned by drug abuse, genetic defects, and hastened along by an atrocious diet. This article will review how I have come up with this assessment.

Controversy Over Cause of Death

When Elvis Presley “unexpectedly” died on August 16, 1977, a great public controversy erupted. The pathologists—including the coroner of Shelby County, Tennessee—found that Elvis died of a heart attack. However, ABC’s “20/20,” anchored by Ted Koppel, believed Elvis had died of a drug overdose and stated there was a cover-up regarding his death. They questioned why criminal charges had not been filed against Dr. Nick by the Shelby County district attorney. The popularity and influence of this show had an impact. The Tennessee medical board

investigated the matter and acquitted Dr. Nick of acting unethically, unprofessionally, or of gross malpractice, but they convicted him of improperly prescribing medications to 10 individual patients, including Elvis Presley and the singer Jerry Lee Lewis. Shortly thereafter, the district attorney general’s office brought a criminal indictment against Dr. Nick alleging that he had willfully and feloniously prescribed controlled substances to the same 10 individuals for which the board found him guilty.

Autopsy Report

Elvis Presley’s autopsy was the root cause of the public controversy. As many have read, Elvis was found dead, face down, on the bathroom floor by his live-in girlfriend, Ginger Alden. How long he had been dead is unknown, but attempts to revive him were unsuccessful. His autopsy was performed at Baptist Memorial Hospital in Memphis on the day he died. The head pathologist was Thomas McChesney, MD; the consultant to the case was Jerry T. Francois, MD, county coroner of Shelby County. The final pathological diagnoses are listed in Table 1, page 46.

One major finding was the severity of Elvis Presley’s heart and cardiovascular disease. Although he was under treatment for hypertension, Dr. Nick—as well as the other doctors who saw Elvis when he was hospitalized—were not aware that his heart was about double the normal size (520 g) and that he had significant atherosclerosis in his coronary vessels, aorta, and cerebral arteries.

It was also discovered that he had an antitrypsin deficiency, which is a rare genetic condition that causes emphysema. Microscopic examination of his lungs revealed “a rare interstitial lymphoid, inflammatory infiltrate, particularly beneath the epithelium of

Table 1. Elvis Presley’s Final Autopsy Report

1	Cardiomegaly with left ventricular hypertrophy
2	Coronary atherosclerosis, mild to moderate
3	Pulmonary edema, mild to moderate
4	Pulmonary aspiration, mild
5	Hepatomegaly due mainly to fatty metamorphosis of liver
6	Splenomegaly, mild, mainly congestive
7	Arteriosclerosis of kidneys, moderate
8	Nephrosclerosis, mild
9	Papillary necrosis, ancient, single papilla, left
10	Atherosclerosis of aorta and cerebral arteries, mild
11	Livor mortis, pronounced, upper half of body
12	Capillary congestion and petechial, skin, upper half of body
13	Chemosis, bilateral, moderate
14	Cardiac puncture wounds, recent
15	Gastric hemorrhage, recent, mild
16	“Soldier’s patch,” pericardium
17	Scar, left inferior eyelid
18	Scar, dorsum, right hand
19	Scar, left buttock
20	Clinical: antitrypsin deficiency (genotype MS)

Additional Immunologic Studies: “Serum immune studies are consistent with hypogammaglobulinemia as indicated by decreased levels of IgA and IgG and an IgM level at the lower limits of normal. These findings are consistent with a chronic disease state.”

The diagnoses listed here are verbatim from Postmortem No. A77-160, Baptist Memorial Hospital, Memphis, August 16, 1977.

bronchi.”⁴ The diagnoses listed in the table are verbatim from Elvis’ autopsy report. Interestingly, the pathologists tested him for immune deficiencies, and found Elvis had hypogammaglobulinemia, a disorder of the body’s immune system, as indicated by decreased levels of immunoglobulin A (IgA) and IgG. Rosette formation studies revealed decreased numbers of T cells and B cells (lymphocytes).

My retrospective review of his

autopsy findings, when paired with his medical history of multi-organ abnormalities over a 10-year period, clearly reveals that Elvis was suffering from an autoimmune inflammatory disorder.⁵⁻¹³ To help support the presence of an autoimmune disease, I found that Dr. Nick’s records revealed, prior to death, that Elvis had eosinophilia and elevated C-reactive protein (CRP).

Toxicology Findings

Samples of Elvis’ serum, urine, and tissues were taken at autopsy and sent to BioScience Laboratories in Van Nuys, California, which, at the time, was considered the most prestigious, accurate, and scientific toxicology laboratory in the United States. My autopsy copy lists 10 different drugs in his serum—including the metabolite of diazepam (Valium)—of which only two had been prescribed by Dr. Nick (Table 2). On October 17, 1977, Ronald Oremich, PhD, and Norman Weissman, PhD, of BioScience, opined:

“Diazepam, methaqualone, phenobarbital, ethchlorvynol, and ethinamate are below or within their respective ranges. Codeine was present at a level approximately 10 times those concentrations found therapeutically. In view of the polypharmacy aspects, this case must be looked at in terms of the cumulative pharmacological effect of the drugs identified by the report.”

This report appeared to contradict the cardiac cause of death, so Baptist Memorial Hospital asked the noted toxicologist Irving Sunshine, PhD, professor of toxicology at Utah University, to review the toxicology findings put forth by BioScience. He put forth this written opinion on March 27, 1978:

“Coupled with this toxicological data are the pathological findings and the reported history that the deceased had been mobile and functional within 8 hours prior to death. Together, all this information points to a conclusion that, whatever tolerance the deceased may have acquired to the many drugs found in his system, the strong probability is that these drugs were the major contribution to his demise.”

The trial of Dr. Nick was not intended to settle the cause of death, but whether he tried to treat Elvis Presley with “good faith.” Consequently, the controversy over the cause of death—cardiac failure or drug overdose—raged until 1994, when the State of Tennessee reopened the autopsy. The State retained the

famed former coroner of Miami-Dade County, Florida, Joseph Davis, MD, who had done thousands of autopsies. He rendered the opinion that Elvis Presley died of a heart attack, which settled the public controversy.¹⁴ His reasons are given here:

“The position of Elvis Presley’s body was such that he was about to sit down on the commode when the seizure occurred. He pitched forward onto the carpet, his rear in the air, and was dead by the time he hit the floor. If it had been a drug overdose, [Elvis Presley] would have slipped into an increasing state of slumber. He would have pulled up his pajama bottoms and crawled to the door to seek help. It takes hours to die from drugs.”

In addition, Dr. Davis noted that Elvis was grossly obese—weighing 350 lbs, more than 50 lbs of which were gained in the last few months—which put an enormous strain on the heart; the body had “at least” 2 hours of rigor mortis; and there was no pulmonary edema, a sign of drug overdose.

My opinion, which I had to offer at Dr. Nick’s trial, was that the drugs must have caused his diseased and damaged heart to stop, but this was irrelevant because Dr. Nick prescribed only two of the many drugs found in his serum. What no one knew at the time was that some drugs, particularly opioids, may interfere with cardiac conduction and cause a fatal, sudden heart stoppage from cardiac arrhythmia. The most notorious example is torsades de pointes, a prolongation of the QT interval, which may occur when opioids and other drugs are taken together. This toxic reaction will most likely occur in a patient with existing heart disease. I now believe that Elvis’ death was partially due to codeine, because he had obtained codeine from a dentist the day before his death. He took several tablets and had a serum level 10 times the therapeutic range.

Table 2 notes that codeine has a

1	Codeine	1.08 ug/mL ^{b,c}
2	Morphine	.03 ug/mL ^c
3	Methaqualone	6.0 ug/mL
4	Diazepam	20 ng/mL
5	N-Desmethyldiazepam	30.5 ng/mL
6	Ethinamate	10-20 ug/mL
7	Ethchlorvynol	5-10 ug/mL
8	Pentobarbital	3.4 ug/mL
9	Phenobarbital	5.0 ug/mL
10	Butobarbital	11.0 ug/mL

^aTaken verbatim from autopsy Postmortem No. A77-160, Baptist Memorial Hospital, Memphis, August 16, 1977.

^bThe ratio of codeine to morphine is 36:1 suggestive of a metabolic defect in codeine metabolism.

^cCodeine levels are about 10 times the therapeutic range.

36 to 1 ratio over morphine. Today, we know that codeine must be converted to morphine to provide pain relief.^{15,16} Codeine is metabolized by the liver enzyme cytochrome P 450-2D6 (CYP2D6). If this enzyme is defective, the conversion does not proceed as it should, which causes codeine to accumulate to toxic levels in the blood. Toxic accumulation of codeine may cause cardiac arrhythmia, particularly if other drugs are in the serum and the heart is already damaged. If Elvis had normal liver metabolism, his serum level of codeine would have been much lower and his serum level of morphine would have been much higher on the toxicology report.

I believe Elvis must have had a CYP2D6 defect. To support this belief is evidence that Elvis had reacted poorly to codeine in the past and his hospital records state he was “allergic to codeine.” Also, Elvis had violent reactions to alcohol. Persons with cytochrome metabolic defects commonly have intolerance to alcohol.

Medical History

Elvis was born on January 8, 1935, in Tupelo, Mississippi. His twin brother died in childbirth. Between birth and age 32, there was essentially no evidence of significant health problems except hypertension (see Timeline, page 48). In 1958, when he was drafted into the US Army at age 23, he was in good health. During his army days, he excelled at doing push-ups. After the army, Elvis took up martial arts, became an expert, and could break boards with a hand chop. He frequently played football with his bodyguards.

Despite being physically fit, Elvis’ lifestyle was medically atrocious.^{14,17} Starting in his late teenage years, Elvis’ habits consisted of a high-fat, high-carbohydrate diet, inadequate sleep, and polydrug use (amphetamines, opioids, and sedatives). As noted, alcohol made him go into rages, so he seldom drank. Apparently, he did not smoke.

Dr. Nick first saw Elvis professionally in 1965 and became his regular doctor on February 27, 1967, when Elvis was 32 years old. At that time, Elvis complained of vertigo, back pain, and insomnia. He was diagnosed with labyrinthitis (infection of

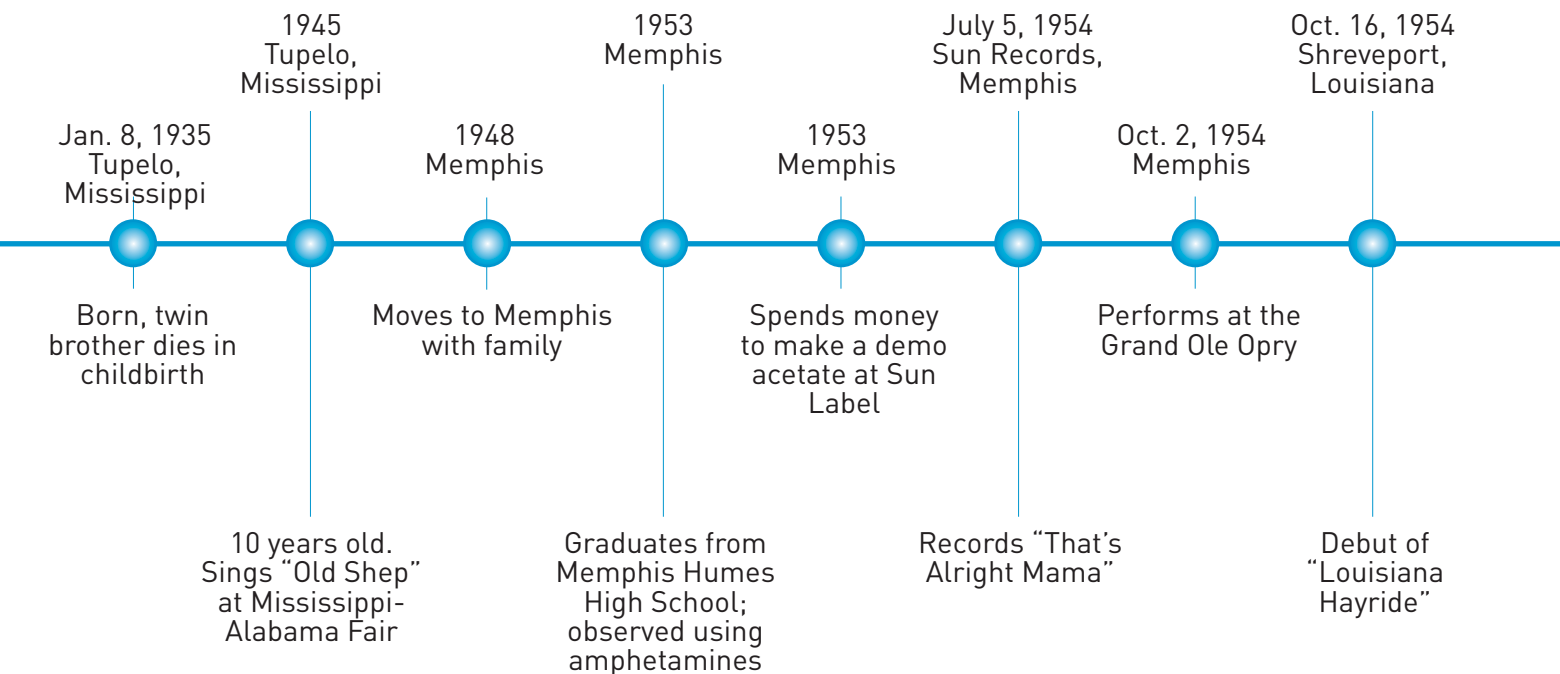
Table 3. Diagnostic Summary of Elvis Presley’s Major Hospitalizations^a

I	October 15 – November 1, 1973 Diagnoses: 1. Edema secondary to cortisone injection 2. Gastric ulcer 3. Hypertension 4. Toxic hepatitis 5. Headache secondary to post-concussion syndrome
II	January 28 – February 13, 1975 Diagnoses: 1. Sigmoid volvulus 2. Megacolon 3. Hypertension 4. Fatty infiltrates of liver
III	August 21 – September 1, 1975 Diagnoses: 1. Fatty liver 2. High cholesterol 3. Hypertension 4. Chronic obstructive pulmonary disease 5. Megacolon from laxative abuse
IV	April 1-5, 1977 ^b Diagnoses: 1. Gastroenteritis 2. Lumbosacral strain 3. Mild anemia

the ear). Hypertension (blood pressure of 140/96 mmHg) was evident at the time. His symptoms of vertigo resolved within about 1 week of treatment of his labyrinthitis. However, he developed tonsillitis shortly after his episode of labyrinthitis. On September 21, 1970, Elvis saw Dr. Nick for an infection or inflammation of his left eye. Elvis’ weight was 163 lbs and his blood pressure continued to be high, 160/100 mmHg. A complete blood count, liver function tests, erythrocyte sedimentation rate, urinalysis, and venereal disease research laboratory test (syphilis test) were all normal with the exception of a slightly high hemoglobin (16.8 g/L) and eosinophil count of 5.5%. When seen again in March 1971, the eye infection had worsened and he was given the diagnoses of an infection of the iris and uveitis. A systemic lupus erythematosus test was normal, but a CRP test was marginally high. In the ensuing year, 1972, Presley

^aHad been hospitalized in 1960 for a finger fracture and again in 1975 for a “spur-of-the-moment” facelift.

^bDied 12 weeks later on August 16, 1977.

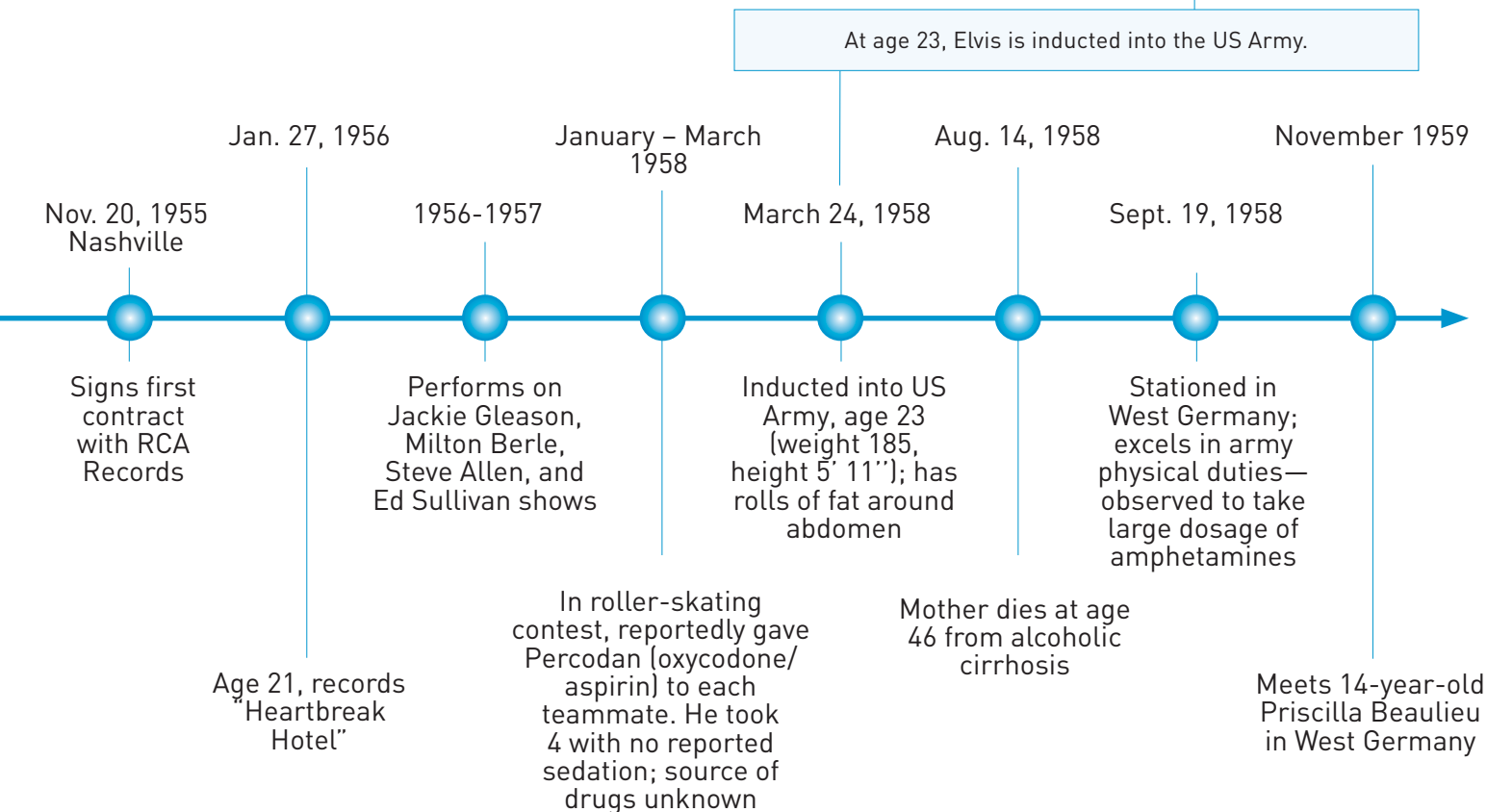


developed 2 or 3 episodes of prostatitis. He also experienced progressive headaches and lumbar spine pain between 1967 and his death in 1977. X-rays of his lumbar spine showed a disc protrusion at L4. His headaches started after a serious head injury in 1967, which is described below.

In 1973, while making movies and doing business in California, his health started its progressive downhill course. At the time, he became very ill and couldn't leave his bed. After he lapsed into a semi-coma, he was flown back to Memphis to be admitted to Baptist Memorial Hospital on October 15, 1973 (Table 3). He entered the hospital with jaundice, severe respiratory distress, marked swelling of his face, distended abdomen, and he was semi-conscious. No fewer than 9 physicians attended or consulted on his case. His liver function tests were abnormally high, indicating that some form of hepatitis was present. A major problem

was discovered—Elvis had been seeing a West Coast doctor who was treating his painful back with a mixture of meperidine (Demerol) and cortisone (probably methylprednisolone). Presley began to swell due to the excess cortisone (known as Cushing's syndrome). The swelling in his face never totally resolved. Cortisol blood tests indicated adrenal insufficiency due to excess cortisone administration. He had a gastric, bleeding ulcer and hepatitis that his physicians also believed were related to excess cortisone. He was not only receiving meperidine from a physician, but he had also been using many abusable drugs. He was given methadone to withdraw from the opioids and suppress withdrawal symptoms. Before leaving the hospital, Elvis was found to have glaucoma in both eyes. He was prescribed special sunglasses by an ophthalmologist and given medications for pain and sleep, among other symptoms. While hospitalized from October

to November 1973, he was prescribed phenobarbital and methadone for drug withdrawal. Symptomatic medications for edema and constipation were furosemide (Lasix), Mylanta, Colace, and Dulcolax. For sleep he was given ethinamate (Valmid), hydroxyzine (Vistaril), and propoxyphene and



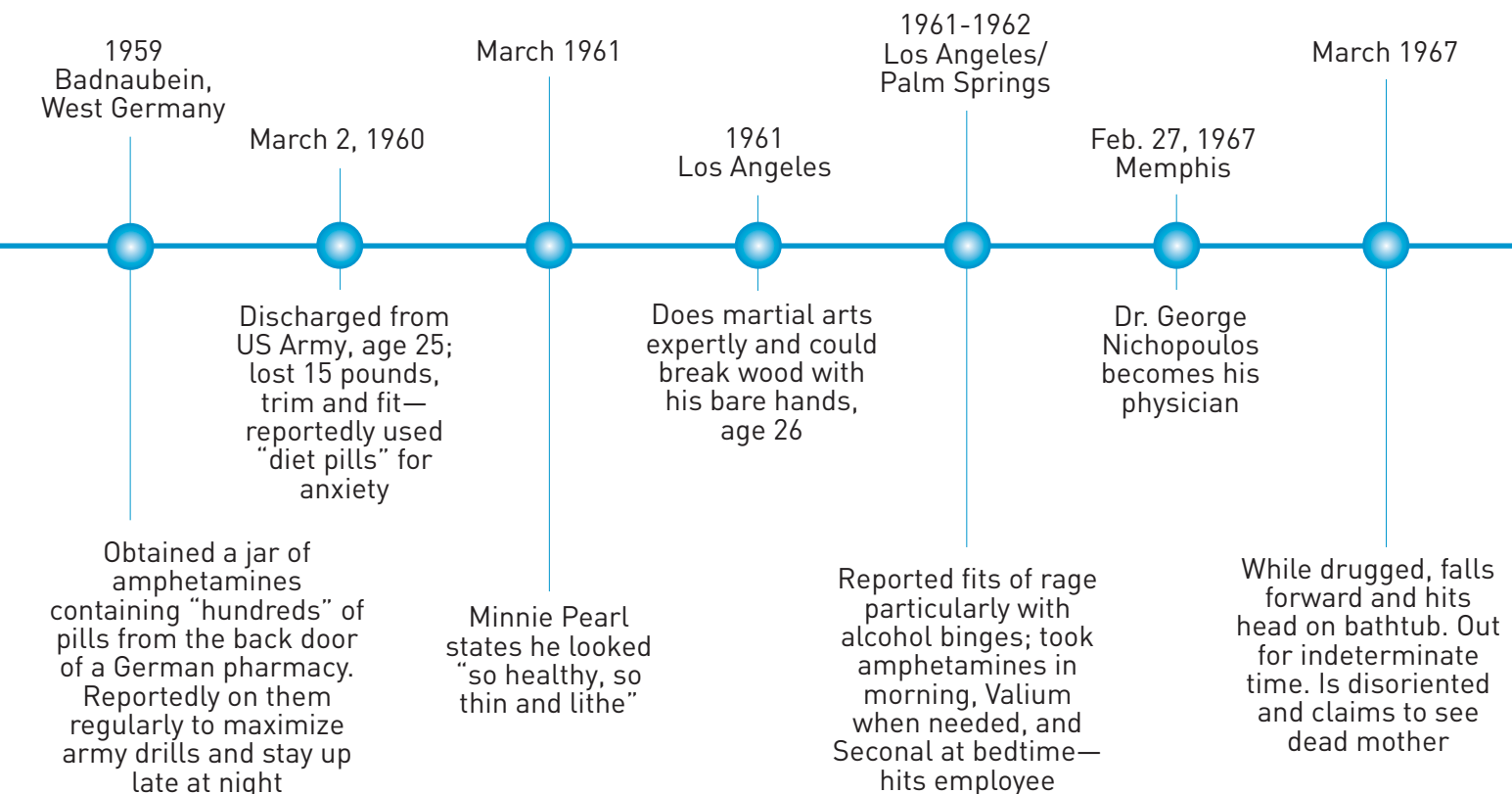
meprobamate (Darvotron). During other hospitalizations, he received meperidine for pain, methaqualone (Quaalude), and hydromorphone (Dilaudid).

Elvis made a reasonably good recovery, was able to return to performing, and functioned reasonably well for a while. His underlying drug abuse, diet, and lifestyle, however, progressively continued to take its toll. Unfortunately, by the beginning of 1974, Elvis was clearly deteriorating.¹⁴ His uncle, Lester Presley, summed it up: “He was fine from 1957 to 1974. But from 1974 onward, he didn’t really feel good. You couldn’t talk to him even if you wanted to.” At one point, *The Houston Post* wrote, “Presley looked, talked, walked, and sang like a very ill man.” Very pertinent is that Elvis constantly complained of aches and pains on stage and off. Elvis was heard

to say on many occasions, “Oh God, I hurt.” He again required hospitalization in early 1975. He continued to have hypertension, high cholesterol, and megacolon, believed to be related to laxative abuse.

Dr. Nick saw fit to assign a full-time nurse, Tish Henley, to watch and care for Elvis both at Graceland and on tour. The nurse was to try to keep drugs away from him, but Elvis was clearly deteriorating mentally and physically and could hardly function alone. Dr. Nick designed a program to ration medications to him and have them administered by the nurse.¹⁴ This program worked quite well for a while. Later that year, Elvis collapsed during a show in Las Vegas. His nurse felt he had a serious drug overdose with respiratory depression. She arranged to urgently fly him from Los Angeles back to Memphis, where he was again

admitted to Baptist Memorial Hospital on August 21, 1975. A new disease entity had appeared—chronic obstructive pulmonary disease (emphysema)—although Presley apparently didn’t smoke. Also, his liver disease had progressed and his megacolon was present. Beginning in late 1976, Elvis was so debilitated that he shut himself off from the outside world and hibernated in the perpetual twilight of his bedroom—eating platters of cheeseburgers and accepting Dr. Nick’s regular pill packets. The pill packets contained a combination of hydromorphone, amobarbital sodium (Amytal), methaqualone, dextroamphetamine (Dexedrine), oxycodone/acetaminophen (Percocet), and a hydrocodone compound (Hycomine). He watched television and concurrently listened to the radio. After coaxing by Dr. Nick—and motivated by his girlfriend, Ginger



Alden—Elvis seemed to recover somewhat in January 1977. This upturn didn't last long. Just a few weeks before his death, Elvis became ill while touring in Louisiana. He developed nausea and symptoms of intestinal flu. He also had pulled a hamstring and strained his back. He entered Baptist Memorial Hospital for the fourth and last time on April 1, 1977. Anemia was found along with his chronic hepatitis, lung

disease, glaucoma, hypertension, and megacolon.

The Cause of Elvis' Decline

Elvis clearly had a disease process that had affected multiple organs—stomach, liver, spine, and eyes—but at the time, his physicians had no idea that he might have had a progressive autoimmune inflammatory disorder (Table 4). The concept of autoimmunity was just starting to be understood. Much to his credit, Dr. Nick gave Elvis the diagnosis of post-concussion syndrome, and believed his headaches were a result of his head injury of 1967 (outlined later). Dr. Nick related to me that, “Elvis was never the same after he hit his head in 1967.”

Table 4. List of Elvis Presley's Involved Organs and Systems

Organs and Systems Involved in Autoimmune Disorder

- Eye
- Liver
- Kidney
- Spine
- Colon
- Lung
- Heart
- Prostate
- Blood vessels
- Anemia
- Stomach

Confirmatory Evidence

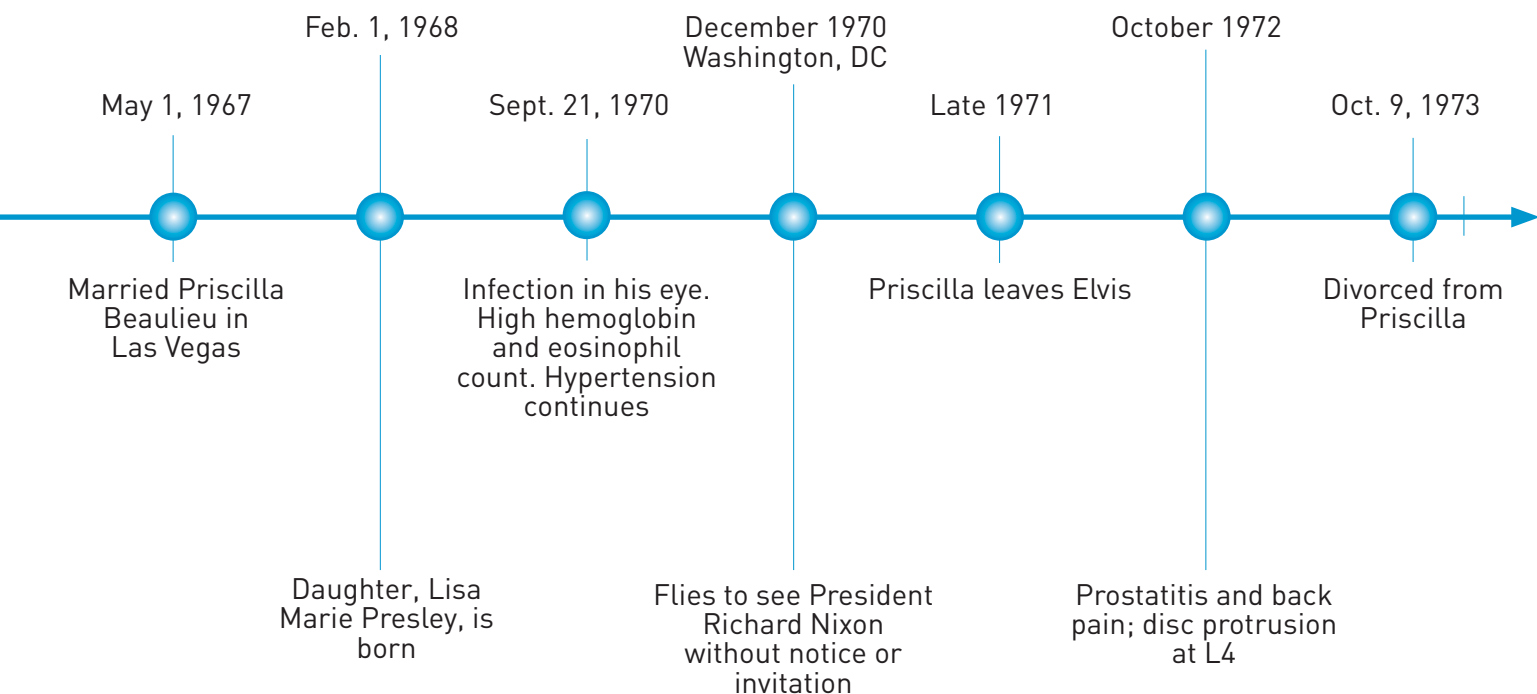
- Hypogammaglobulinemia
- Lymphocytic lung infiltrates
- Eosinophilia
- Antitrypsin deficiency



Elvis Presley with President Richard Nixon. By Elvis_Presley_1970.jpg: Ollie Atkins, chief White House photographer at the time. See ARC record. derivative work: Sir James [Elvis_Presley_1970.jpg] [Public domain], via Wikimedia Commons

Traumatic Brain Injury

The most underappreciated factor in the decline of Elvis Presley's health and early death was repeated head trauma.



It is now recognized that multiple head trauma can cause an autoimmune inflammatory disorder that can attack any organ in the body.^{5-13,18-21} Contemporary terms for the pathologic developments that may occur following head trauma are post-concussion syndrome, TBI, and chronic traumatic encephalopathy. Some of the post-trauma symptoms include memory loss, obsessive-compulsive traits, and irrational or illogical behavior.^{10,21} Elvis demonstrated many of these obsessive-compulsive and erratic behaviors at different times. For example, he gave luxurious gifts to strangers, took spur-of-the-moment flights across country, and waged an imaginary campaign against illegal drug dealers. On one occasion in 1970, he impulsively flew to Washington, DC, and called on President Richard Nixon without a prior appointment. He got

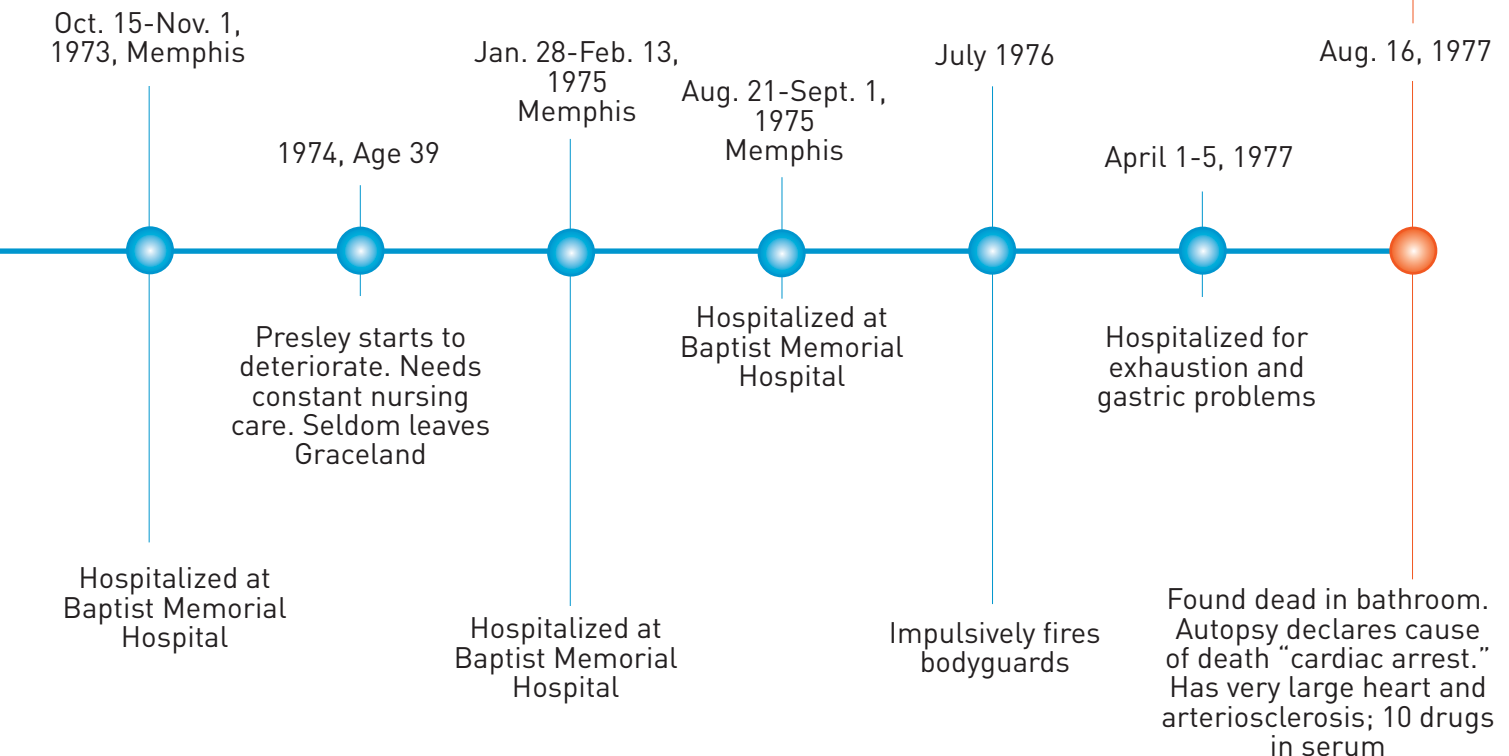
a “spur-of-the-moment” facelift in 1975. His expenses soared to about \$500,000 per month, and his entertainment group was essentially bankrupt just before his death due to his lavish, irrational expenditures. The first documented instance of head trauma occurred in 1956 (Table 5). It is reported that Elvis pulled his Lincoln Continental into a Memphis gas station and asked the attendant to check his air conditioner. When passersby spotted him, they surrounded him and asked for his autograph. The attendant asked him to move and Elvis said, “Okay man, just gimme a minute,” and he continued to sign autographs. This angered the attendant, who slapped Presley across the face. Elvis returned the punch and another attendant joined into the fight. All three were eventually arrested on charges of assault and battery, and disorderly conduct.¹⁴ Later that year, Elvis and his

musicians were seated at a long table in the swank Shalimar Room of Toledo’s Commodore Perry Hotel. A young rough-and-tumble construction worker apparently wanted to impress a girl he met at the bar. He went over to Presley’s table and brusquely asked, “Are you Elvis Presley?” Elvis stood up



Photo by Jan Kronsell, 2002

Elvis burial site at Graceland, Memphis, Tennessee



and reached out his hand to shake, but instead of shaking his hand, the man clobbered Elvis across his face. He was momentarily stunned.¹⁴

Just before he entered the army in 1958, Elvis booked the Rainbow Rollerdome in Memphis for 7 nights in a row and gathered up a band of skaters to play endless self-invented “war” games. Elvis was downed at least once by a full-body charge of a fellow skater. The games were rough enough that Elvis provided each skater with an oxycodone/aspirin (Percodan) tablet. Elvis downed at least 4 Percodans at a time.¹⁴

The most serious head trauma occurred in Bel Air, Los Angeles, in 1967 just before he filmed “Clambake.” He tripped over a television cord in the bathroom and falling headfirst, Elvis hit his head on the porcelain bathtub. He was knocked out cold and lay there for an indeterminate amount of time. He eventually awoke and began cursing, which awakened his girlfriend, later his wife, Priscilla, who found him slumped on the floor. Elvis cradled his head and a golf-ball sized lump developed. Doctors were called. Interestingly, Presley stated, “I think I really did hurt myself.” The next day he was clearly “out of it” and had to be driven back to Memphis to recuperate. His aides described his mood as “despondent.” On the way back, he would stop frequently at a pay phone, call a Memphis DJ, and request that he repeatedly play Tom Jones’ “Green Green Grass of Home.” Once he got to Graceland, he claimed to see his deceased mother standing in her old bedroom.

After his TBIs, Elvis’ behavior became progressively erratic and irrational.⁷⁻¹³ For example, it is reported that in 1975 he refused to bathe and developed sores on his body. He ordered unknown pills from Sweden, which supposedly would cleanse him

Date/Place	Event
1956	Fight at a Memphis gas station
1956	Slugged by a man in Toledo
1958	Knocked down in a roller skating contest
1967	Tripped over a television cord and hit his head on the bathtub. Unconscious for indeterminable amount of time.

^aIn addition, Elvis Presley had periods in his life in which he participated in martial arts, football, and horse and motorcycle riding. He also had at least four major drug overdoses, which required resuscitation.

from within. During his 2 weeks of hospitalization in August–September 1975, he complained of 26 headaches, 14 bouts of insomnia, and “general pain, hurting all over” 4 or 5 times each nursing shift. The triad of insomnia, headaches, and pain all over is typical of TBI victims.

Patients with head trauma are now frequently enrolled in pain clinics. Their pain is clearly one of a central nature that has a fibromyalgia distribution, which patients describe as pain “all over.”²¹ Presley developed such pain during the last few years of his life. Patients with TBI currently treated by the author have severe constant pain, insomnia, depression, and a variety of mental impairments. All have hypothalamic-pituitary hormone abnormalities and autoimmune inflammatory signs and symptoms.

Autoimmune Inflammatory Disease

A retrospective analysis of Elvis’ head trauma clearly shows that Presley developed or accelerated his autoimmune inflammatory disease after his most serious head trauma in 1967.^{5,18-21} His previous bouts of head trauma probably contributed to his deterioration, as multiple head traumas are cumulative in effect. Autoimmunity following TBI has historically been believed to occur as a result of hypothalamic-pituitary dysfunction.^{18,20} A new belief is that head trauma causes brain tissue to be

jarred loose, and leak into the general circulation through the blood-brain barrier.²² Brain tissue is not supposed to enter the blood circulation because it is toxic or antigenic to the rest of the body. If this truly occurs, and this author believes it does, it acts like an infectious agent or vaccine in that it causes antibodies to form. These antibodies then become “auto” and start attacking normal tissue. It’s even possible these abnormal antibodies attack and further damage the brain.

Autoantibodies attack in a random fashion. One day they attack the joints and the next the eye, heart, or liver. Presley clearly suffered multi-organ attacks based on his clinical history, and they varied over time in typical autoimmune fashion. One of the problems with autoimmunity is that it produces inflammation and lowers one’s resistance to infections. Inflammation of the arteries in the heart (coronary) and brain (cerebral) are now known to be an end result of inflammation. Presley had hypertension and arteriosclerosis independent of his autoimmune disease, but his autoimmune disorder undoubtedly accelerated the inflammatory process. It is noteworthy that Elvis could not do his usual gyrations on stage in the last couple years of his life as a result of rigidity and spasticity. At times, he even had to use a cane to walk. Pain develops in joints and muscles with TBI.²¹ It is likely that some

of Presley's random-appearing drug use was an attempt to treat himself.

Drug Abuse, Addiction, and Overdoses

Elvis Presley's drug problem was legendary.^{14,17} What is not appreciated is that he had at least four serious overdoses that caused coma and necessity of resuscitation before his death. If one survives an overdose, the big risk is residual brain damage caused

and pharmacists in California, Nevada, and Tennessee who would supply him with prescription drugs. Many of his acquaintances relate how he conned pharmacies, staff, physicians, and dentists to prescribe or furnish drugs to him.

Elvis' manager, Colonel Thomas Parker, hoped his marriage to Priscilla would reduce his drug use, and it seemed to for a while. However, the drug use and bizarre behaviors appar-

food from Presley's windpipe" eight different times. His second drug overdose occurred on June 28, 1973, requiring Dr. Nick to revive him with stimulants.

There are two basic theories about why a person abuses a multiplicity of drugs. One is to achieve a euphoria or mind set to escape the rigors of boredom or a stressful life. The other is that some people are born with odd or strange feelings and sensations and take a wide variety of drugs to treat themselves. It is my experience that TBI patients take many drugs at random in an attempt to treat the many strange symptoms, feelings, and sensations that TBI may bring. Elvis seemed to have both reasons to take drugs at different times. Another factor in his drug use may be that he never had much of a chance to grow up and be a normal person. Before he was 21, he was famous, adored, sought after, and rich. An escape from reality by drug use is a common route for those who never "get a life."

Dr. Nick tried about every trick a doctor could do to control Elvis' drug use. He would find drugs in Elvis' house or on tours and destroy them. He tried to prescribe the least harmful drugs while keeping Elvis functional. He constantly substituted placebos. Dr. Nick, Priscilla, and friends repeatedly tried to get him to enter a chemical dependency treatment unit, but he always refused. Given the circumstance, I don't know what else his doctor could have done to help him. One thing is clear: his drug abuse led to falls, head trauma, and overdoses that damaged his brain. At the time he died, he was essentially non-functional and required constant nursing care.

Summary

This medical analysis has been done in great part to bring attention to TBI. I believe Elvis Presley clearly knew he was deathly ill, but didn't know why. In

I believe Elvis Presley clearly knew he was deathly ill, but didn't know why. In retrospect, I believe Elvis Presley was a classic case of cumulative head trauma, followed by an autoimmune inflammatory disorder.

by a lack of oxygen. Elvis' drug abuse started with amphetamines when he was a teenager and it escalated while in the army. He was known to bribe German pharmacies for large quantities of amphetamines.¹⁴ After his discharge, Presley spent a period abusing alcohol. He did not drink regularly (see section on CYP 450 defect), but when he did he drank excessively. When drinking, he had temper tantrums and got into physical fights with members of his entourage on at least two occasions. In his late 20s and 30s, his drinking was accompanied by an increasing use of amphetamines and sedatives. His drug-use progression escalated after his fall in the bathroom in 1967, and he added regular opioid use to his repertoire of the drugs he abused. Unfortunately, Elvis had a cadre of physicians, dentists,

entally became so bad that she left him in 1971. In January 1973, Elvis Presley was booked for a month of shows in Las Vegas. The physicians at the Las Vegas Hilton where Elvis stayed supplied him with unlimited quantities of dextroamphetamine, diazepam, ethinamate, hydromorphone, and meperidine.¹⁴ He also started to inject opioids. Dosage with injectable drugs is hard to control, and on January 23, 1973, Elvis suffered his first overdose from injectable hydromorphone. His live-in girlfriend found him comatose in bed and almost not breathing. Fortunately, the hotel doctor brought in oxygen. After this event, he continued to abuse drugs. Elvis' girlfriend, Linda Thompson, reported that he took so many drugs he would fall asleep while chewing, and she claimed she "clawed

retrospect, I believe Elvis Presley was a classic case of cumulative head trauma, followed by an autoimmune inflammatory disorder. None of this was known or recognized in his day. I'm confident he would be pleased to know his predicament may help others, as he was a kind and generous person.²³

Only recently has there been an understanding that TBI may cause bizarre behaviors such as reclusivity, obsessive-compulsive habits, paranoia, hostility, peculiar sex habits, poor hygiene, and drug use. It may also cause hypothalamic-pituitary dysfunction and trigger an autoimmune inflammatory process that may produce, over time, a multi-system disorder. The centralized pain syndrome of TBI may not only produce pain in the form of headaches but also spine, joint, and muscular pain. These patients are often misdiagnosed as having "fibromyalgia." Head trauma can be cumulative, meaning that each additional trauma adds to the risk and symptomatology. Drug overdoses, of which Presley had

several, usually cause anoxia to the brain and may worsen the problem of brain dysfunction caused by trauma. All of this was on top of several genetic problems including hypertension, megacolon, cytochrome defects, and antitrypsin deficiency.

Thankfully, today patients with head trauma are now beginning to frequent pain practices. Elvis Presley certainly antagonized his condition with an atrocious diet, drug use, and lifestyle. However, a study of Elvis Presley's medical history is most instructive as to how TBI can lead to serious clinical conditions that can possibly be prevented and treated. ■

Credits and Materials Used

Most material, other than information directly derived from Elvis Presley's files and records, is from the detailed book, *Down at the End of Lonely Street: The Life and Death of Elvis Presley*, written by Peter Harry Brown and Pat Broeske. This work was written in 1997 and contains detailed information after

years of investigation by these two authors.¹⁴ I contributed to the facts as I knew them, but knowledge of Presley's underlying medical condition was not known at the time. Partly due to my and others encouragement, Dr. George Nichopoulos gave an interview to Dennis Breo of the American Medical Association in 1986, which contains many of his medical thoughts about Elvis.¹⁷ The book, *I Called Him Babe: Elvis Presley's Nurse Remembers*, by Marion J. Cocke, was most insightful into his impaired condition and medical care as she was his main registered nurse in Memphis.²³

This paper could not have been written without the direct assistance of Carol Shifflett, of Sewick, Pennsylvania, author of *Migraine Brains & Bodies: A Comprehensive Guide to Solving the Mystery of Your Migraines* and *Aikido Exercises for Teaching and Training*. Carol is a true journalistic expert on head trauma and was able to help me sort out the medical mystery of Elvis Presley.

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