

Life Expectancy in the Courtroom, Especially as It Relates to Spinal Cord Injury Patients

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For spinal cord injury patients, survival beyond year one is a question of money and treatment, not a medical question. Why? Seventy years of data have proven that patients who survive the critical early years now go on to live for decades. Seventy years of survival data from two studies, an Australian study and a British study. In a court of law, how many of those decades they actually experience can be worth millions of dollars.

Life expectancy is not a simple ratio. It is not the “number of people measured divided by number of people in a standard population.” Instead, a count divided by a second count yields a ratio - not years of expected life. This ratio describes a crude death rate, which is driven by a population’s age structure and is not comparable between the correct method and among different populations without age-standardization measures. Most attorneys are not familiar with the correct definition that life expectancy comes from a PERIOD LIFE TABLE built on age-specific death rates, calculated as follows:

$nMx \rightarrow nqx \rightarrow lx \rightarrow ndx \rightarrow nLx \rightarrow Tx$,
Then $Ex = Tx / lx$

Statistical agencies say that period tables systemically understate lifespan when mortality rates are improving. It is a choice to anchor damages to a period table, but it is a choice that can be challenged in court.

Internationally, the World Health Organization (WHO) provides comparable rankings of countries that are misleading because there is no standardization and countries do not count live births the same. It is not “21 weeks gestation, 400 grams or better in weight, and breathing independently.” This is wrong because no WHO instrument uses 21 weeks or 400 grams anywhere, and breathing is not required. The correct definition is a follow: “... irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life, such as

breathing of the heart, pulsation of the umbilical cord, or definite movement of the voluntary muscles...” Under this definition, there is no gestational-age threshold and no weight threshold. A heartbeat alone is sufficient.

Two landmark longitudinal studies, an Australian study and a British study report seventy years of spinal cord injury survival data. In the celebrated 2012 Australian study 2,014 patients were admitted to a New South Wales specialized clinic between January 1955 and June 2006 the study concluded that even the highest-level injuries retained roughly two-thirds of a normal lifespan [1].

- General Population: 100% - Reference base
- T1-S5 Paraplegia: 89-91% of normal life expectancy
- C5-C8 Tetraplegia: 65-74% of normal life expectancy
- C1-C4 Tetraplegia: 64-69% of normal life expectancy

This shows that major spinal cord injury cases, where the plaintiff survived the critical early years, will have added decades of life expectancy.

The British study on the other hand examined 5,483 patients to two specialized spinal centers in Stoke Mandeville and Southport. These were patients injured between 1943 and 2010. Nearly 80% were male and the average age at injury was 35. Years after the study was completed, some 54% of the first-year survivors were still alive at the end of 2014, even some who were injured as far back as 1943.

Since 2010, lifespan of spinal cord injury patients has slightly improved. Between 1950 and 1990, there were significant improvements in lifespan of spinal cord injury patients. Between 1990 and 2010, the lifespan plateaued, but continues to improve again since 2010. This study proves that surgical breakthroughs are not the reason why survivors keep improving their survival

rates [2]. Instead, the main reason found is related to professional attendant care. For example, earlier access to specialized treatment plus getting through the first two years results in extending life expectancy for decades. These two Australian and British studies prove that better care produces longer life. Longer lives require larger and more expensive life care plans.

Inexperienced attorneys will be surprised to learn that access to income of the injured patient at the time of injury also serves to help predict life expectancy and death. The household income affects the adjusted mortality odds this way:

- Income of \$75,000 and above: 1.00 odds - Reference base
- Income of \$25,000 - \$75,000: 1.61x the odds of survival; and
- Income under \$25,000: death is imminent at 2.41x the odds of survival [3].

Outside of the hospital, the services by professional attendant care providers make up at least two-thirds of the life care plans for major spinal cord cases. About 90 percent of major spinal cord patients experience between 8 and 14 preventable complications each year. As a result, some 29 percent are rehospitalized at least once a year for an average of 18 days; the leading cause is genitourinary or skin infections. Pressure injuries make up 25 percent of preventable complications in the first year [4]. The indwelling catheter represents 2.72 episodes per 100 patient-days. Autonomic dysreflexia has a 93% prevalence at or above T6 on ambulatory monitoring and 43 percent when asymptomatic. This can cause hemorrhage, seizures and ultimately early deaths.

Qualified professional attendants are hired to manage the following:

- Pressure ulcer prevention: repositioning, skin inspection, and equipment;
- Bladder program and catheter hygiene - the leading cause of rehospitalization;
- Bowel program;
- Respiratory management and secretion clearance;
- Recognizing autonomic dysreflexia, which is asymptomatic 43 percent of the time; and
- Spasticity, pain, and osteoporosis management.

If a patient is injured at age 25, the lifetime cost of care, in 2025 dollars, is as follows:

- High Tetraplegia C1-C4 = **\$6,419,617** – First year = \$1,446,827 to \$251,246 each later year;
- Low Tetraplegia C5-C8 = **\$4,690,573** – First year = \$1,045,459 to \$154,128 each later year;
- Paraplegia = **\$3,139,165** – First year = \$705,131 to \$93,409 each later year;
- Motor Functional AIS D = **\$2,144,693** – First year = \$472,190 to \$57,353 each later year [5].

The circularity argument at the heart of every major spinal cord case is: if you reduce the funding, you reduce the life expectancy. Why? Because major spinal cord injury patients who do not receive optimal funding to finance a complete life care plan, will not receive optimal care. Because the care of spinal cord injury is prohibitively expensive, the life expectancy results vary significantly based on whether the patient has public versus private insurance. For example, those patients who have access to a specialized spinal cord center, have a 93 percent chance of surviving the critical first two years and a higher probability of adding decades to their lifespan.

In summary, regardless of the injury to the spinal cord, immediate care and treatment leads to survival beyond year two and depending on the income, qualified attendant care, and general medical follow up, life expectancy can approximate normalcy.

References

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