What is a Fatigue Expert?

Many litigation cases are won or lost on the testimony of an expert witness. But picking a “fatigue expert”, or assessing the competence of opposing counsel’s “fatigue expert”, is an especially challenging task with many potential pitfalls.

At the heart of the problem is the term “Fatigue,” which is often used very loosely by lay people (or unqualified experts) to describe a wide range of disparate human conditions, including:

a. **Sleep deprivation**: Fatigue develops as the result of an extended time awake (acute sleep deprivation), or reduced time asleep, or disrupted or poor quality sleep (partial sleep deprivation), or from the cumulative effect of multiple days with shortened or disrupted sleep such as may occur in jobs with extended work hours or with night shift work (chronic sleep deprivation).

b. **Sleep disorders**: Fatigue manifested as excessive daytime sleepiness is the most common presenting complaint in sleep disorders, such as obstructive sleep apnea, restless legs syndrome, narcolepsy or most of the other 85 different sleep disorders listed in the International Classification of Sleep Disorders, 2nd Edition (2005)\(^1\).

c. **Illness or disease**: Fatigue is common in many diseases and illnesses (ranging from flu to cancer) which may occur as a direct result of the metabolic or other systemic pathophysiological disturbances of that disease, as a secondary consequence of sleep disturbances caused by other symptoms such as pain, nausea etc., or as the primary presenting complaint (e.g. chronic fatigue syndrome).

d. **Therapeutic Side-Effect**: Fatigue is a commonly listed side-effect of prescription or over-the-counter pharmacological drugs, or may occur as the result of other therapeutic interventions (e.g. surgical procedure).

e. **Stimulant Drug Usage**: Fatigue often occurs as a person rebounds after the initial euphoria or “high” induced by illegal or prescription stimulant pharmacological substances.

f. **Physical Exertion**: Fatigue occurs as the result of extended hours of work with heavy muscular activity (e.g. lumberjack, or marathon runner), or with repetitive motion of a limited number of muscle groups, after the task, in proportion to the relative fitness (and/or prior training) of the individual.

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\(^1\) Westchester, IL: American Academy of Sleep Medicine (http://www.absm.org/PDF/ICSD.pdf).
It is essential to clarify claims of fatigue expertise and establish where the expertise of the potential witness really lies to determine what they really mean when they opine about fatigue. Having a Ph.D. or M.D. does not automatically qualify the expert across all the various aspects of fatigue. The academic scientific disciplines which study mental fatigue which causes driver drowsiness, and loss of attention behind the wheel (e.g. the sleep deprivation and sleep disorder causes of mental fatigue) are quite distinct from the scientific disciplines which study physical fatigue (e.g. physical exertion causing muscle fatigue).

When the issue is mental fatigue the qualifications of the expert need to be in the scientific disciplines of alertness, sleep and circadian physiology and the pathophysiology of sleep disorders. In contrast, questions of physical (muscle) fatigue need experts qualified in the disciplines of ergonomics, human factors and/or exercise physiology.

For example, the scientific basis of mental fatigue relies upon the physiology of sleep and sleepiness, the regulation of circadian rhythms of alertness and sleepiness by the circadian pacemakers in the hypothalamus of the brain, and the impact of sleep deprivation and circadian phase on mood and human behavior and performance. This constitutes a distinct highly established scientific field as evidenced by:

a. The over 12,000 individual members and 53 scientific and medical sleep society members in the World Federation of Sleep Research & Sleep Medicine which works in collaboration with the World Association of Sleep Medicine to advance knowledge about sleep, circadian rhythms, sleep health and sleep disorders worldwide.²

b. International and national scientific societies, conferences and meetings including the Associated Professional Sleep Societies, LLC (APSS) (a joint conference of the American Academy of Sleep Medicine and the Sleep Research Society) annual conference, a premier gathering attended by 6,000 to 7,000 professionals annually in the field of sleep medicine and sleep research.

c. The over 8,000 scientific peer reviewed articles on the research advances and findings of the field, published in major scientific journals including Science, Nature, and hundreds of other journals plus books, conference reports and government reports in 2016.³

So when you qualify the next expert who seems willing to opine about mental fatigue (e.g. driver fatigue, pilot fatigue, etc.) ask them a few questions. Has he or she:

a. received any specialized training on sleep physiology and/or deprivation, and/or on sleep disorders?


³ Search term “sleep deprivation” in www.scholar.google.com limited to articles published in 2016
b. received an academic degree(s) that specifically relates to sleep, alertness and circadian physiology?

c. conducted any scientific research on issues of sleep physiology and/or deprivation?

d. had experience on the application of this research to fatigue in the workplace or on the highway?

e. presented his/her research at any sleep conferences?

f. published any peer reviewed scientific papers on issues of sleep, alertness and circadian physiology?

g. demonstrated an ability to distinguish between hours of service, or duty-rest regulations and actual fatigue?

In the past 30 years we have seen all types of people offering themselves as experts in fatigue. They range from the lay opinion, to the highly degreed academic in the wrong discipline. Quite obviously, the real difference between an expert who will help make or break your case is the depth and nature of the expert’s background within this complex issue called fatigue.

Approaching this choice carefully and thoroughly is the only way to ensure that your choice of fatigue expert will not keep you awake at night.