

# Homicide by Fright: The Intersection of Cardiology and Criminal Law

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The prevailing lay wisdom associates emotional stress with sudden death, and recent medical reports have linked massive catecholamine surges with demonstrable cardiac dysfunction that can be either reversible or fatal. This association does not strictly prove causality, and the question remains open for additional scientific investigation. From the legal viewpoint, however, the issue has been resolved, and case law clearly holds that sudden emotional stress can cause death. More significantly, case law also holds that if the sudden emotional stress is caused by criminal conduct, the resulting death of a victim of the criminal conduct can be prosecuted as homicide. Cardiologists are often called to testify in such circumstances. In the present study, we have reviewed 8 legal cases that are the basis of current opinions in these matters. These legal principles can be summarized as follows: emotional stress is sufficient, and physical abuse is not required for conviction; a time-lapse between the induction of emotional stress and death does not necessarily mitigate the charge of homicide; the criminal act must be the proximate cause of the victim's death; however, the accused does not always need to be physically present to commit the crime. In conclusion, although the pathophysiology of sudden death associated with massive emotional stress has not been fully elucidated from a scientific viewpoint, in the legal system, the association can be causative and can be the basis for a criminal prosecution. Cardiologists may be called on to provide expert opinions in the prosecution of these cases. Published by Elsevier Inc. (Am J Cardiol 2010;105:136–138)

Throughout recorded history, profound emotion has been associated with sudden death. Ancient scripts and scrolls have contained references to this relation long before any scientific understanding had been reached of the influence of psychological factors on cardiac pathophysiology.<sup>1</sup> The *New Testament* recounts such an episode when Peter spoke to Ananias and charged: "You have not lied to man but to God." On learning this, Ananias collapsed and died.<sup>2</sup> Likewise, Chilon of Lacedaemon is said to have died from joy when he embraced his son who had just attained an Olympic boxing triumph.<sup>3</sup>

In the recent past, increased cardiac mortality after psychological stress was observed during the 1991 Gulf War. There, missile attacks were concentrated against the civilian population in Tel Aviv. Among the fearful civilian residents, both the incidence of acute myocardial infarction and the overall mortality rate increased after the attacks.<sup>4</sup> The increase was seen largely in the area of Tel Aviv where the attacks occurred. Similarly, recent earthquakes and other natural disasters have also been associated with excess cardiac mortality.<sup>4</sup>

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Case studies and observational reports in the medical literature have suggested that neurohumoral mechanisms probably explain the association between emotional stress and cardiac damage or death<sup>5</sup>; however, the question remains open, because no definitive study has been performed, nor is it likely that any such study could be mounted in the future.

## Legal Cases

Although medicine might continue to retain some degree of skepticism of the causal relation between fear and sudden death, current law does not. Homicide is defined as "the killing of one human being by the act, procurement, or omission of another."<sup>6</sup> Early on, the law recognized putting one in fear of one's life as a causative factor in homicide. Under common law, a physical injury or battery was originally required to accompany the death to constitute a homicide.

**Regina v. Murton:** For instance, in the 1862 case of *Regina v. Murton*,<sup>7</sup> the victim was in poor health and suffered from various debilitating ailments. Her husband threw her on the floor, struck her, and ejected her from the house, after which he brought 2 other women into the house. The victim went to a neighbor's house, complaining that her husband had "broken her heart." Ten days later she died, and her husband was charged with homicide. Medical testimony was adduced to the effect that not only would the physical abuse she suffered have served to aggravate her disease, but also that the mental anguish could have likewise proved fatal. The court instructed the jury that if her death had resulted from mental anguish alone, there could be no conviction. If the physical abuse to this frail woman had to aggravate her under-

lying disease and cause death, a guilty verdict should be returned, which is what the jury ultimately found.

Some suggest that this early judicial insistence that the death be accompanied by some physical injury was an effort to prevent mischievous witchcraft prosecutions.<sup>8</sup> Today, most courts do not require a physical component to accompany the infliction of fear and emotional distress that leads to death.

**People v. Stamp:** In *People v. Stamp*,<sup>9</sup> 2 defendants entered an office and ordered the employees to lie on the floor. One defendant, armed with a gun, then entered the separate office of the manager, a 60-year-old man with a history of heart disease, and ordered him to join the others on the floor. They took money and, when leaving, told the victims to remain on the floor for 5 minutes. When the Office Manager arose from the floor, he was pale and short of breath. When the police arrived, approximately 15 minutes after the robbery, the manager said he was not feeling well and had chest pain. He collapsed on the floor 2 minutes later and was taken to a hospital, where he was pronounced dead on arrival.

Three physicians testified that although the decedent had a history of atherosclerosis, he would not have died absent the fright induced by the robbery. Opposing expert testimony maintained it could not be established, with reasonable medical certainty, that fright alone could be fatal. The defendants were found guilty of both robbery and first-degree murder and sentenced to life in prison. On appeal, the defendants argued that the evidence was insufficient to prove that the robbery caused the victim's death. The appellate court disagreed, stating that the evidence was more than sufficient. It was found to be adequately demonstrated that, but for the robbery and the fright that it had induced, the victim would not have experienced a fatal heart attack and died.

**State v. Edwards:** In a similar case, *State v. Edwards*,<sup>10</sup> the defendant and his accomplices entered a bar in Tucson, Arizona and committed a robbery at gunpoint. Shortly after the robbers had fled, the proprietor experienced a heart attack and died. The defendant argued that the victim's death was accidental and unintended and could not constitute murder. Moreover, the defendant maintained that the evidence was insufficient to prove that the robbery actually caused the victim's death. The court disagreed on both counts, finding first that accidental, unintended consequences could form the basis of a murder conviction. Second, the court pointed to the testimony of a pathologist that the death was caused by anxiety resulting from the robbery at gunpoint. The court held that this provided adequate evidence to support causation.

**Stewart v. State:** A sudden cardiac death somewhat removed in time, under appropriate circumstances, can still support a homicide conviction. In *Stewart v. State*,<sup>11</sup> an unarmed man entered a motel, handing the desk clerk a note demanding money. The clerk, a 60-year-old woman, gave him \$176.00 and he fled. She then called police, who arrived within minutes. The clerk recounted the details of the robbery to the police but soon complained of difficulty breathing. An ambulance was summoned and transported her to a nearby hospital for evaluation. Slightly >2 hours after the robbery, she experienced cardiac arrest at the hospital and died. The defendant was convicted of felony-murder but

appealed, claiming that the robbery could not have been the proximate cause of sudden cardiac death that occurred 2 hours later. The appellate court disagreed, pointing to the trial testimony of a cardiologist who examined the victim's medical records and reviewed microscopic slides of her heart muscle. In his opinion, "adrenaline-like substances caused the heart to overcontract" and the resultant microscopic changes were "an absolute hallmark of this kind of stress-induced death." The cardiologist further testified that death of the heart muscle "is brought on by huge amounts of adrenaline dumped into the system causing the heart muscle to react like a horse that has been whipped to the point where it collapses." The court held that the evidence presented on causation was sufficient to sustain the conviction.

**People v. Klosin:** In another case, *People v. Klosin*,<sup>12</sup> the defendant's break-in and gunpoint robbery caused the victim to experience fright and stress. Two days later, the victim died, and medical testimony was presented that the defendant's actions had caused the death. The defendant was convicted of second-degree murder and appealed, contending that the verdict was against the weight of the evidence concerning death caused by fright. The appellate court upheld the verdict, ruling that the evidence was sufficient to support a murder conviction.

**Commonwealth v. Tatro:** As in other crimes, individual accomplices need not be physically present to be charged with a crime. In *Commonwealth v. Tatro*,<sup>13</sup> the defendant and others planned a robbery. He stayed in the front seat of the car while his accomplices, brandishing a shotgun, entered a store and demanded money. The proprietor fled and shouted for others to call police. He then became unconscious and died. A forensic pathologist testified that his death was caused by the fright resulting from the armed robbery, and the defendant was convicted of manslaughter. On appeal, the appellate court affirmed the conviction, holding that the evidence on causation was sufficient to sustain a conviction.

**Hubbard v. Commonwealth:** The accused's act must always be the proximate cause of the victim's death. In cases in which the death is too remote or not the natural consequence of the act, a conviction will not stand. In *Hubbard v. Commonwealth*,<sup>14</sup> for instance, the accused was arrested for public intoxication. The jailer took hold of him, but he resisted and both fell to the floor. Thirty minutes later, the jailer, who had heart disease, died from a heart attack. The prosecution produced medical testimony that the excitement had accelerated his death and the accused was convicted of voluntary manslaughter and sentenced to imprisonment for 2 years. On appeal, the Court of Appeals of Kentucky reversed the judgment, observing that the accused's conduct was not sufficiently proximate to impose criminal responsibility. The court observed that the jailer not only knew that he had heart disease but also knew that he should avoid exertion. In effect, the case stands for the proposition that although some illegal acts can trigger a cascade of events that results in a victim's death, not every such precipitating illegal act can be said to be the proximate cause. Such a consequence must be foreseeable.

**Todd v. Florida:** Similarly, in *Todd v. Florida*,<sup>15</sup> the defendant's criminal act was found not to be the proximate cause of the victim's death. There, the defendant stole \$110 from the collection plate at church. A member of the congregation witnessed the theft and got in his car to pursue the defendant. The victim had a pre-existing heart condition and, while driving, lost control of his vehicle and collided with a tree at low speed. He later had a heart attack and died. The defendant was charged with manslaughter, and he moved to dismiss the charge. The motion was denied, and he appealed. The appellate court reversed, holding that the theft had too distant a relation to the victim's death. The victim was not placed in fear and did not die from fright at witnessing the theft. Rather, his pursuit of the thief actually caused the heart attack. This fatal result was not a directly foreseeable risk of petty theft and could not support the causation requirement for a manslaughter conviction.

## Discussion

Although the lay public has long believed emotional factors, such as fear, to be a trigger for sudden cardiac death, the cardiology community has historically regarded this anecdotal evidence with more skepticism. Perhaps this is because observational epidemiologic studies that have linked stress to fatal cardiac events have not identified any precise physiologic mechanism. The multifactorial nature of coronary disease and other confounding variables have left some physicians unconvinced. However, the medical community has begun to investigate several possible pathophysiologic mechanisms that would conclusively establish the link between emotions such as fear and sudden death. One recent study examined the effect of emotional triggers, such as fear, on the sympathetic nervous system.<sup>16</sup> Sympathetic activation increases cardiac output and blood flow, which can produce ischemia and potentially lead to an adverse outcome in those with underlying coronary disease.<sup>4</sup> Likewise, some evidence exists that diseased coronary vessels constrict in response to stress, contributing to plaque rupture and occlusive coronary thrombosis.<sup>3</sup> It has also been suggested that the "fight or flight" response can lead to increased platelet activity and a state of hypercoagulation.<sup>4</sup> Finally, some models have identified autonomic nervous system activation as triggering alterations in neural transmission to the heart, thereby creating cardiac electrical instability and predisposing to lethal arrhythmias, such as ventricular fibrillation.<sup>4</sup>

More recently, Japanese investigators reported the observation of "takotsubo" (octopus trap) cardiomyopathy, or stunning of the left ventricular apex in association with sudden and severe psychological stress.<sup>17</sup> The condition was given this name because of the appearance of the ballooning left ventricular apex on the angiogram, resembling the narrow-necked, wide-based octopus trap used by Japanese fishermen. Wittstein et al<sup>5</sup> reported on 19 patients with this syndrome who had neurohumeral evaluations during their acute illness. They demonstrated increased levels of catecholamines and, in 5 patients who had undergone endomyocardial biopsy, contraction bands with and without myocardial necrosis, suggesting that "exaggerated sym-

thetic stimulation is probably central to the cause of this syndrome."

Although early reports of takotsubo cardiomyopathy stressed the generally favorable prognosis of those patients admitted for in-patient care, a later systematic review has reported an in-hospital mortality rate of nearly 2%.<sup>18</sup> The actual incidence of emotional stress-related sudden cardiac death is simply not known. Clinicians continue to investigate possible pathophysiologic mechanisms that would conclusively establish the link between sudden emotional stress and sudden death.

With respect to instances in which death by inducement of severe emotional stress is considered homicide, case law has established several principles with which cardiologists, who might be called as expert witnesses, should be familiar. In early days, when witchcraft was a vital issue, it was a requisite that the emotional stress be accompanied by some form of physical abuse.<sup>7,8</sup> In the modern era, this is no longer the case.<sup>9,10</sup> The time-lapse, even  $\leq 2$  days, between the induction of emotional stress and the death does not mitigate the charge of homicide.<sup>11,12</sup> The accused does not always need to be physically present to commit the crime<sup>13</sup>; however, the act must be the proximate cause of the victim's death.<sup>14,15</sup>

These 8 cases serve to illustrate that although medical science is still striving to explain the complex pathophysiologic mechanism between fright and sudden cardiac death, the law has long accepted the infliction of fright as an accepted means of committing homicide. Regardless of future changes in our medical understanding of sudden cardiac death, it is expected that the law will forever recognize, under certain circumstances, sudden cardiac death resulting from fright as a criminal matter.

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