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SJC-09964

ROBIN K. MATSUYAMA, executrix,¹ vs. NEIL S. BIRNBAUM & another.²

Norfolk. March 4, 2008. - July 23, 2008.

Present: Marshall, C.J., Greaney, Ireland, Spina, Cowin, Cordy, & Botsford, JJ.

Negligence, Doctor, Medical malpractice, Wrongful death, Loss of chance, Causation. Medical Malpractice, Complaint. Wrongful Death. Damages, Wrongful death, Loss of chance. Practice, Civil, Instructions to jury.

Civil action commenced in the Superior Court Department on June 21, 2000.

The case was tried before Ernest B. Murphy, J.

The Supreme Judicial Court granted an application for direct appellate review.

Peter C. Knight (Tory A. Weigand with him) for Neil S. Birnbaum.

Max Borten (Sidney Gorovitz with him) for the plaintiff.

John D. Bruce, for Dedham Medical Associates, Inc., was present but did not argue.

Paul F. Leavis, Michael J. Harris, & J. Michael Conley, for Massachusetts Academy of Trial Attorneys, amicus curiae, submitted a brief.

John J. Barter, for Professional Liability Foundation, amicus curiae, submitted a brief.

¹ Of the estate of Kimiyoshi Matsuyama.

² Dedham Medical Associates, Inc.

MARSHALL, C.J. We are asked to determine whether Massachusetts law permits recovery for a "loss of chance" in a medical malpractice wrongful death action, where a jury found that the defendant physician's negligence deprived the plaintiff's decedent of a less than even chance of surviving cancer. We answer in the affirmative.³ As we later explain more fully, the loss of chance doctrine views a person's prospects for surviving a serious medical condition as something of value, even if the possibility of recovery was less than even prior to the physician's tortious conduct. Where a physician's negligence reduces or eliminates the patient's prospects for achieving a more favorable medical outcome, the physician has harmed the patient and is liable for damages. Permitting recovery for loss of chance is particularly appropriate in the area of medical negligence. Our decision today is limited to such claims.

The case before us was tried before a jury in the Superior Court. In response to special questions, the jury found the defendant physician negligent in misdiagnosing the condition of the decedent over a period of approximately three years. They found as well that the physician's negligence was a "substantial

³ The loss of chance doctrine is also known as the "lost opportunity" doctrine. See Restatement (Third) of Torts: Liability for Physical Harm § 26 comment n (Proposed Final Draft No. 1, 2005) (Draft Restatement). See generally King, Jr., Causation, Valuation, and Chance in Personal Injury Torts Involving Preexisting Conditions and Future Consequences, Yale L.J. 1353, 1365-1366 (1981) (King I).

contributing factor" to the decedent's death. They awarded \$160,000 to the decedent's estate for the pain and suffering caused by the physician's negligence, and \$328,125 to the decedent's widow and son for the decedent's loss of chance.⁴ The defendants appealed, asserting, among other things, that loss of chance was not cognizable under the Massachusetts wrongful death statute, see G. L. c. 229, §§ 2 and 6,⁵ or otherwise. We granted their application for direct appellate review.

We conclude that recognizing loss of chance in the limited domain of medical negligence advances the fundamental goals and principles of our tort law. We also conclude that recognizing a cause of action from loss of chance of survival under the wrongful death statute comports with the common law of wrongful death as it has developed in the Commonwealth.⁶ See Gaudette v.

⁴ The damages for loss of chance were apportioned between the decedent's widow and son. Those damages were reduced in a subsequent amended judgment to \$281,310 to adjust for the receipt of Social Security survivor benefits.

⁵ General Laws c. 229, § 2, provides in relevant part: "A person who . . . by his negligence causes the death of a person . . . shall be liable in damages." General Laws c. 229, § 6, provides: "In any civil action brought under section two . . . damages may be recovered for conscious suffering resulting from the same injury, but any sum so recovered shall be held and disposed of by the executors or administrators as assets of the estate of the deceased."

⁶ In a wrongful death action, loss of chance of survival is equivalent to loss of chance of a more favorable outcome (i.e., an outcome more favorable than death). See generally King, Jr., "Reduction of Likelihood" Reformulation and Other Retrofitting of the Loss-of-a-Chance Doctrine, 28 U. Memphis L. Rev. 491, 505 (1998) (King II) (characterizing loss of chance as "loss of chance of a more favorable outcome"). Because this appeal concerns a wrongful death action, we will sometimes refer simply

Webb, 362 Mass. 60, 71 (1972) (recognizing common-law origin of wrongful death actions in Commonwealth). The application of the doctrine to the evidence in this case supported the jury's findings as to loss of chance liability. Finally, although we determine that some portions of the jury instructions do not conform in all respects to the guidelines we set out below, they were broadly consistent with our decision today. Accordingly, we affirm.⁷

1. Background. On the record before us, the jury could have found the following: the defendant, Dr. Neil S. Birnbaum, a board-certified internist and president of the board of the codefendant, Dedham Medical Associates, Inc. (Medical Associates), became the primary care physician of the decedent, Kimiyoshi Matsuyama, in July, 1995, when the forty-two year old Matsuyama presented himself for a routine physical examination. Matsuyama's medical records at the time of his initial visit to Birnbaum disclosed complaints of gastric distress dating back to 1988. The records also indicated that in 1994 Matsuyama's previous physician had noted that Matsuyama might need an upper gastrointestinal series or small bowel follow-through further to

to "survival" rather than to "a more favorable outcome."

⁷ We acknowledge amicus briefs filed by the Professional Liability Foundation in support of the defendants and by the Massachusetts Academy of Trial Attorneys in support of the plaintiff.

evaluate his symptoms.⁸ During the physical Matsuyama complained, as Birnbaum testified at trial, of "heartburn and difficulty breathing associated with eating and lifting." Birnbaum testified that he was aware at the time that, as a person of Asian ancestry who had lived in Korea and Japan for the first twenty-four years of his life and had a history of smoking, Matsuyama was at a significantly higher risk for developing gastric cancer than was the general population of the United States.⁹ Nevertheless, Birnbaum did not order any tests to determine the cause of Matsuyama's complaints. Based on his physical examination alone, Birnbaum diagnosed Matsuyama with gastrointestinal reflux disease and recommended over-the-counter medications to relieve Matsuyama's symptoms. Birnbaum followed a similar course of action in October, 1996, when Matsuyama returned for a sick visit, complaining that his heartburn was worse and that he had gastric pain after eating.

In September, 1997, Matsuyama consulted Birnbaum about moles that had recently developed on his body. On visual inspection,

⁸ Although Birnbaum testified at trial that he had no specific recollection of having reviewed Matsuyama's prior medical records before or during the visit, he testified that he had access to those records and that it was his practice to review a patient's prior medical records when "the clinical situation" so required.

⁹ Birnbaum testified that a person who lived in Japan or Korea and ate the foods of those areas would have ten to twenty times the risk of developing gastric cancer than would a member of the general population of the United States.

Birnbaum made a diagnosis of "one benign seborrhea keratosis."¹⁰ Birnbaum testified at trial that such moles are "common" and "not something that I would [have] overly been that fearful of."

Matsuyama next appeared for an office visit with Birnbaum on September 1, 1998, for a followup to a recent urgent care visit and for concerns about a mole over his left eye. Birnbaum was aware at the time that on August, 24, 1998, Matsuyama had presented himself at Medical Associates's urgent care facility complaining of severe stomach pain during the previous forty-eight hours, which the urgent care physician had diagnosed as gastritis. Birnbaum made a clinical diagnosis of nonulcer dyspepsia, again without the benefit of any evaluative gastrointestinal tests.¹¹ However, he did order a test on Matsuyama to determine the presence of *Helicobacter pylori* (*H. pylori*), a bacteria associated with gastric cancer, among other gastric maladies. When the test came back positive for *H. pylori*, Birnbaum directed his nurse to inform Matsuyama of the test results and to call in medications to treat Matsuyama's

¹⁰ Birnbaum identified "seborrhea keratosis" as a benign, waxy, darkly pigmented skin lesion. The jury heard conflicting testimony about whether Birnbaum's notes revealed the presence of one such lesion, as Birnbaum testified at trial, or more than one. The jury also heard testimony from Matsuyama's oncologist and the plaintiff's medical expert that the appearance of many seborrheic keratoses signals advanced stomach cancer. At the time of the examination, Birnbaum was unaware that seborrheic keratoses may signal gastric cancer.

¹¹ Throughout the trial the jury heard evidence that gastritis and nonulcerative dyspepsia may be linked to gastric cancer.

H. pylori. Neither the nurse nor Birnbaum told Matsuyama about the association of H. pylori with gastrointestinal diseases, of which Birnbaum was aware. By this time, Birnbaum testified, gastritis "probably was my leading diagnosis," but he did not order an endoscopy with biopsy or an upper gastrointestinal series, which he knew would definitively confirm or rule out his diagnosis.

When Matsuyama next appeared in Birnbaum's office in November, 1998, for a routine checkup and followup, Birnbaum noted that the patient "was feeling better" and had no "significant symptoms" of gastric distress. Such was not the case on May 3, 1999, when Matsuyama went to Birnbaum complaining of epigastric pain, vomiting, sudden weight loss, and premature feelings of fullness after eating. Birnbaum ordered a gastrointestinal series and an abdominal ultrasound, which revealed a two-centimeter mass in Matsuyama's stomach. Subsequent medical procedures confirmed the presence of infiltrative gastric adenoid carcinoma, signet ring cell type. Matsuyama then began treatment with specialists. He succumbed to gastric cancer the following October, leaving his wife and his minor son.

In June, 2000, the plaintiff filed suit against Birnbaum and Medical Associates. Her complaint, as amended, alleged wrongful death, breach of contract, and negligence against both

defendants.¹² Trial began in the Superior Court in July, 2004. The jury heard testimony from, among others,¹³ the plaintiff's expert witness, Dr. Stuart Ira Finkel, a gastroenterologist. Finkel testified that, in his opinion, Birnbaum breached the applicable standard of care in evaluating and treating Matsuyama, resulting in Matsuyama's death. Specifically, Finkel opined that, in light of Matsuyama's complaints, symptoms, and risk factors, including the presence of H. pylori, his Japanese ancestry, his having lived in Japan or Korea for extended periods, his smoking history, and other well-known risk factors, an internist exercising the expected standard of care would have ordered an upper gastrointestinal series X-ray or an endoscopy, or referred Matsuyama to a specialist for endoscopy, beginning in 1995. The expert also testified that the appearance of Matsuyama's seborrheic keratosis in September, 1997, "could have

¹² The plaintiff alleged a separate count of "negligence-wrongful death" against Birnbaum and "negligence" against Dedham Medical Associates, Inc. (Medical Associates), and separate negligence counts against both defendants for failure to obtain informed consent and for conscious pain and suffering.

¹³ The plaintiff called Birnbaum to testify about his treatment of Matsuyama. Birnbaum also testified regarding the capitation contracts between Harvard Pilgrim Health Care, Matsuyama's medical insurance provider, and Medical Associates, which Birnbaum reviewed and approved as president of Medical Associates's board of directors. Among other things, the capitation contracts rewarded Medical Associates (and its physician shareholders, including Birnbaum) for keeping the costs of prescription drugs and medical tests such as biopsies below a certain annual figure. Birnbaum testified that the capitated contracts governed his reimbursements for Matsuyama, and that they effectively meant that doctors in his practice "ha[d] difficulty" providing capitated patients with "the best medical care for the patients."

and should have" triggered a suspicion of stomach cancer "right then and there." Finkel told the jury that if Birnbaum had ordered the appropriate testing on Matsuyama in 1995, the cancer "would have been diagnosed" and "treated in a timely fashion when it might still have been curable." As a result of Birnbaum's failure to make a timely diagnosis, Finkel opined, the cancer metastasized to an advanced, inoperable phase, resulting in Matsuyama's premature death.¹⁴

In the course of his testimony, Finkel offered an extensive discussion of the tumor-lymph nodes-metastasis (TNM) method for classifying gastric cancer into separate "stages," from stage 0 to stage 4, with each higher stage signaling a more advanced cancer and carrying a statistically diminished chance for survival, as measured by the standard gastric cancer metric of five years cancer free after treatment.^{15,16} Patients with stage

¹⁴ The plaintiff also called two of the physicians who treated Matsuyama for gastric cancer. Dr. Benjamin Smith, who performed the endoscopic evaluation on Matsuyama in May, 1999, testified that the existence of cancer cannot be determined by physical examination alone, and that endoscopy with biopsies was the acknowledged "gold standard" for diagnosing gastric cancer. Dr. Charles Fuchs, Matsuyama's oncologist, testified, among other things, that Matsuyama had several known risk factors for gastric cancer, that endoscopy with a biopsy was the best way to determine the presence of such cancer, and that early stage detection of gastric cancer portends a better chance of survival.

¹⁵ These standards are well known. The National Cancer Institute's Dictionary of Cancer Terms defines "survival rate" as: "The percentage of people in a study or treatment group who are alive for a certain period of time after they were diagnosed with or treated for a disease, such as cancer. The survival rate is often stated as a five-year survival rate, which is the percentage of people in a study or treatment group who are alive five years after diagnosis or treatment. Also called overall

0, in which the cancer is confined to the stomach lining, have a better than 90% survival rate, Finkel averred; at stage 1, the survival rate drops to between 60% and 80%; at stage 2, between 30% and 50%; at stage 3, between 10% and 20%; and at stage 4, less than 4%.¹⁷ Finkel opined that, as a result of Birnbaum's breach of the standard of care, Matsuyama lost the opportunity of having gastric cancer "diagnosed and treated in a timely fashion when it might still have been curable."

Dr. Mark Peppercorn, a gastroenterologist, testified as an expert for the defense. He testified that Birnbaum did not deviate from the accepted standard of care over the course of his treatment of Matsuyama; that Matsuyama's type of stomach cancer had "a different biology, a different characteristic from garden variety, if you want to use that poor term, cancer"; and that his

survival rate." Survival is a term whose particular definition will depend on the medical evidence in a given case.

¹⁶ Fuchs, the oncologist who treated Matsuyama and was called as a witness by the plaintiff, also testified that "the metric in cancer is at five years, what fraction, what percentage are alive . . . if they're alive in five years, we typically say that they're cured or that the cancer is unlikely to come back." Finkel, the plaintiff's expert witness, similarly referred to "survival rate" and "five-year survival" interchangeably. Dr. Mark Peppercorn, the defense expert witness, testified that the five-year survival rate is "the parameter most people use; it doesn't necessarily mean they're cured, but that's the parameter people use, five year survival." None of the experts or physicians who testified at trial offered an alternative metric for gauging the success of treating gastric cancer.

¹⁷ Both Birnbaum and his expert witness, Peppercorn, also testified that gastric cancer has "stages," with a high probability for survival at stage 1 and 5% probability or less at stage 4. Birnbaum agreed with the plaintiff's counsel that the five-year survival rate at stage 1 is 90% to 95%.

type of cancer did not manifest symptoms until it was in an advanced stage. Peppercorn testified that staging of cancers is done by oncologists for treatment, not actuarial, purposes, with the following presumed five-year survival rates: at stage 1, from 60% to 90%; at stage 2, 25% to 40%; at stage 3, up to 10%; and at stage 4, "practically zero; less than [5%], probably."

In addition to the medical expert testimony, the jury heard testimony from the plaintiff's forensic economist, Dr. Dana Hewins. Hewins testified that, using the standard statistical measures and methods in his field, Matsuyama, had he not died when he did, could have been expected to work an additional 17.7 years, during which time Matsuyama's net earnings from his income minus his personal consumption would have been \$466,235.¹⁸ Hewins also testified that Matsuyama could have been expected to live an additional 28.32 years (to age seventy-five), during which time the monetary value of his household services would have been \$157,225. Thus, had Matsuyama attained his full work life and life expectancies, he would have contributed \$623,460 to his household. Hewins did not offer any projections concerning what Matsuyama would have contributed in wages or services to his

¹⁸ Hewins's figure for net loss of earnings assumed that Matsuyama would have used 30% of his gross earnings for personal consumption; his net loss of earnings figure did not consider taxes on Matsuyama's earnings. The evidence at trial showed that Matsuyama would not have been able to work to full capacity while he was being treated for cancer. Hewins testified that the work life statistics he employed to calculate income lost as a result of Matsuyama's death accounted for such contingencies as illness, disability, or retirement.

family had he died later than he did but earlier than his full work life and life expectancies.

After a six-day trial, the case went to the jury.¹⁹ In response to special questions, the jury found Birnbaum negligent in Matsuyama's treatment, but found him not grossly negligent. They also found that Birnbaum's negligence was a "substantial contributing factor" to Matsuyama's death,²⁰ and awarded Matsuyama's estate \$160,000 for pain and suffering caused by the negligence. Then, in response to a special jury question, see note 51, infra, the jury awarded damages for loss of chance, which they calculated as follows: they awarded \$875,000 as "full" wrongful death damages,²¹ and found that Matsuyama was suffering from stage 2 adenocarcinoma at the time of Birnbaum's initial negligence and had a 37.5% chance of survival at that time. They awarded the plaintiff "final" loss of chance damages

¹⁹ At the close of the plaintiff's evidence, her counsel moved to add a count for gross negligence, which the judge allowed as to Birnbaum over his counsel's objection. On Birnbaum's motion for a directed verdict, the judge dismissed only the claims for breach of contract and lack of informed consent. He later extended this ruling to the counts for breach of contract and lack of informed consent against Medical Associates on Medical Associates's oral motion.

²⁰ The judge instructed the jury that "substantial" "doesn't mean that Mr. Matsuyama's chance of survival was [50%] or greater, only that there was a fair chance of survival or cure had Dr. Birnbaum not been negligent and had he conformed to the applicable standard of care."

²¹ This figure was an aggregate amount that included, in the words of the special question, losses for Matsuyama's "expected net income, services, protection, care, assistance, society, companionship, comfort, guidance, counsel and advice."

of \$328,125 (\$875,000 multiplied by .375). Judgment entered against the defendants, jointly and severally, on the negligence-wrongful death count in the amount of \$328,125, later amended to \$281,310, see note 4, supra. A separate judgment entered against the defendants, jointly and severally, for damages in the amount of \$160,000 on the counts for conscious pain and suffering.²²

2. Loss of chance. Although we address the issue for the first time today, a substantial and growing majority of the States that have considered the question have indorsed the loss of chance doctrine, in one form or another, in medical malpractice actions.²³ We join that majority to ensure that the

²² Prior to submitting the case to the jury, the judge withdrew from the jury the question whether Medical Associates was vicariously liable for Birnbaum's wrongful actions, and determined as a matter of law that vicarious liability applied.

²³ The highest courts of at least twenty States and the District of Columbia have adopted the loss of chance doctrine. See Thompson v. Sun City Community Hosp., Inc., 141 Ariz. 597 (1984); Ferrell v. Rosenbaum, 691 A.2d 641 (D.C. 1997); Holton v. Memorial Hosp., 176 Ill. 2d 95 (1997); Cahoon v. Cummings 734 N.E.2d 535 (Ind. 2000); DeBurkarte v. Louvar, 393 N.W.2d 131 (Iowa 1986); Delaney v. Cade, 255 Kan. 199 (1994); Hastings v. Baton Rouge Gen. Hosp., 498 So. 2d 713, 720-722 (La. 1986); Wollen v. DePaul Health Ctr., 828 S.W.2d 681 (Mo. 1992); Aasheim v. Humberger, 215 Mont. 127 (1985); Perez v. Las Vegas Med. Ctr., 107 Nev. 1 (1991); Evers v. Dollinger, 95 N.J. 399 (1984); Alberts v. Schultz, 126 N.M. 807 (1999); Roberts v. Ohio Permanente Med. Group, Inc., 76 Ohio St. 3d 483 (1996); McKellips v. Saint Francis Hosp., Inc., 741 P.2d 467 (Okla. 1987); Hamil v. Bashline, 481 Pa. 256 (1978); Jorgenson v. Vener, 616 N.W.2d 366 (S.D. 2000); Brown v. Koulizakis, 229 Va. 524 (1985); Herskovits v. Group Health Coop. of Puget Sound, 99 Wash. 2d 609 (1983); Thornton v. CAMC, 172 W. Va. 360 (1983); Ehlinger v. Sipes, 155 Wis. 2d 1 (1990); McMackin v. Johnson County Healthcare Ctr., 73 P.3d 1094 (Wyo. 2003), S.C., 88 P.3d 491 (Wyo. 2004). One additional State's high court recognized loss of chance, Falcon v. Memorial Hosp., 436 Mich. 443 (1990), but the Legislature subsequently amended its medical malpractice statute to state

fundamental aims and principles of our tort law remain fully applicable to the modern world of sophisticated medical diagnosis and treatment.

The development of the loss of chance doctrine offers a window into why it is needed. The doctrine originated in dissatisfaction with the prevailing "all or nothing" rule of tort

that a "plaintiff cannot recover for loss of an opportunity to survive or an opportunity to achieve a better result unless the opportunity was greater than 50%." Mich. Comp. Laws Ann. § 600.2912a(2) (West), as amended by 193 Mich. Pub. Acts 78, § 1, (effective April 1, 1994). See also Boone v. William W. Backus Hosp., 272 Conn. 551 (2005) (adopting loss of chance doctrine, but also apparently retaining requirement that decedent "had at least a 51 percent chance of survival" prior to negligence).

Ten States' high courts have, in contrast, refused to adopt the loss of chance doctrine. See Gooding v. University Hosp. Bldg., Inc., 445 So. 2d 1015 (Fla. 1984); Manning v. Twin Falls Clinic & Hosp., Inc., 830 P.2d 1185 (Idaho 1992); Fennell v. Southern Md. Hosp. Ctr., Inc., 320 Md. 776 (1990); Fabio v. Bellomo, 504 N.W.2d 758, 762 (Minn. 1993) ("We have never recognized loss of chance in the context of a medical malpractice action, and we decline to recognize it in this case"); Ladner v. Campbell, 515 So. 2d 882 (Miss. 1987); Pillsbury-Flood v. Portsmouth Hosp., 512 A.2d 1126 (N.H. 1986); Kilpatrick v. Bryant, 868 S.W.2d 594, 602-603 (Tenn. 1993); Kramer v. Lewisville Memorial Hosp., 858 S.W.2d 397, 402-407 (Tex. 1993); Jones v. Owings, 318 S.C. 72 (1995); Smith v. Parrott, 175 Vt. 375 (2003). Two other States' high courts have held that loss of chance claims are incompatible with their States' wrongful death statutes, but have not decided whether loss of chance claims are otherwise actionable. See United States v. Cumberbatch, 647 A.2d 1098, 1102-1104 (Del. 1994); Joshi v. Providence Health Sys. of Or. Corp., 342 Or. 152 (2006).

Other States' high courts have not addressed the issue or have explicitly left the question open. See, e.g., Holt v. Wagner, 344 Ark. 691 (2001) ("not closing the door to the future adoption of one of the versions of lost chance of survival" when issue is properly presented). The Draft Restatement, supra at § 26 comment n, discusses loss of chance but "takes no position on this matter, leaving it for future development and future Restatements."

recovery. See generally King, Jr., Causation, Valuation, and Chance in Personal Injury Torts Involving Preexisting Conditions and Future Consequences, Yale L.J. 1353, 1365-1366 (1981) (King I). Under the all or nothing rule, a plaintiff may recover damages only by showing that the defendant's negligence more likely than not caused the ultimate outcome, in this case the patient's death; if the plaintiff meets this burden, the plaintiff then recovers 100% of her damages.²⁴ Thus, if a patient had a 51% chance of survival, and the negligent misdiagnosis or treatment caused that chance to drop to zero, the estate is awarded full wrongful death damages.²⁵ On the other hand, if a patient had a 49% chance of survival, and the negligent misdiagnosis or treatment caused that chance to drop to zero, the plaintiff receives nothing. So long as the patient's

²⁴ Our appellate courts have not used the term "all or nothing" rule to refer to the tort principle that, in a medical malpractice action for wrongful death, once the defendant's negligence is shown to be more probably than not the cause of the person's death, the plaintiff is entitled to recover 100% of the value of all associated losses. However, the principle is enumerated in countless cases. See generally Harlow v. Chin, 405 Mass. 697, 714 (1989), and cases cited (in medical malpractice case, restating causal relationship rule, affirming damages award based on expert testimony of actuarial life expectancy). See also Murphy v. Conway, 360 Mass. 746, 750 (1972) (case in which plaintiff failed to produce expert evidence that defendant's negligent treatment of decedent's sore throat caused her death: "The evidence is insufficient to establish the probability that the decedent would have lived longer or suffered less even if the defendant had diagnosed and treated" illness properly).

²⁵ That is, the full value of "the reasonably expected net income, services, protection, care, assistance, society, companionship, comfort, guidance, counsel, and advice of the decedent." G. L. c. 229, § 2.

chance of survival before the physician's negligence was less than even, it is logically impossible for her to show that the physician's negligence was the but-for cause of her death, so she can recover nothing.²⁶ Thus, the all or nothing rule provides a "blanket release from liability for doctors and hospitals any time there was less than a 50 percent chance of survival, regardless of how flagrant the negligence." Herskovits v. Group Health Coop. of Puget Sound, 99 Wash. 2d 609, 614 (1983).

As many courts and commentators have noted, the all or nothing rule is inadequate to advance the fundamental aims of tort law. See generally Restatement (Second) of Torts § 901 (1979) (delineating distinct rationales for tort liability); K.S. Abraham, *Forms and Functions of Tort Law* 14-20 (3d ed. 2007) (same). Fundamentally, the all or nothing approach does not serve the basic aim of "fairly allocating the costs and risks of human injuries," O'Brien v. Christensen, 422 Mass. 281, 288 (1996), quoting Vertentes v. Barletta Co., 392 Mass. 165, 171 (1984) (Abrams, J., concurring).²⁷ See King I, supra at 1377

²⁶ This is because, when a plaintiff loses a less than even chance of survival, it was less likely than not that the negligence was a but-for cause of death. See Alholm v. Wareham, 371 Mass. 621, 626-627 (1976), quoting Bigwood v. Boston & N. St. Ry., 209 Mass. 345, 348 (1911) ("While the plaintiff is not bound to exclude every other possibility of cause for his injury except that of the negligence of the defendant, he is required to show by evidence a greater likelihood that it came from an act of negligence for which the defendant is responsible than from a cause for which the defendant is not liable").

²⁷ In Bradford v. Baystate Med Ctr., 415 Mass. 202, 208 (1993), this court noted that "there is reason to question a rule of law that would totally exonerate a negligent physician from

(all or nothing rule places loss of chance losses "outside tort law," thereby "distort[ing] the loss-assigning role of tort law"). The all or nothing rule "fails to deter" medical negligence because it immunizes "whole areas of medical practice from liability." McMackin v. Johnson County Healthcare Ctr., 73 P.3d 1094, 1099 (Wyo. 2003), S.C., 88 P. 3d 491 (Wyo 2004). It fails to provide the proper incentives to ensure that the care patients receive does not slip below the "standard of care and skill of the average member of the profession practising the specialty." Brune v. Belinkoff, 354 Mass. 102, 109 (1968). And the all or nothing rule fails to ensure that victims, who incur the real harm of losing their opportunity for a better outcome, are fairly compensated for their loss. See Delaney v. Cade, 255 Kan. 199, 209 (1994), quoting Keith, Loss of Chance: A Modern Proportional Approach to Damages in Texas, 44 Baylor L. Rev. 759, 760 (1992) ("the loss of chance doctrine serves to fairly compensate the plaintiff for the tortious deprivation of an opportunity to live longer or recover from a physical injury or condition inflicted by the defendant's wrongful act or omission").

As the Supreme Court of Wyoming recently stated:

"First, the loss of an improved chance of survival or improvement in condition, even if the original odds were less than fifty percent, is an opportunity lost due to negligence. Much treatment of diseases is aimed

tort liability when the patient had a fair, but less than even, chance of survival if the physician had not been negligent," but expressly reserved the issue we decide today. Id.

at extending life for brief periods and improving its quality rather than curing the underlying disease. Much of the American health care dollar is spent on such treatments, aimed at improving the odds. In the words of the Delaware Supreme Court, '[i]t is unjust not to remedy such a loss.' Second, immunizing whole areas of medical practice from liability by requiring proof by more than fifty percent that the negligence caused the injury fails to deter negligence conduct. As Judge Posner wrote in DePass v. United States, 'A tortfeasor should not get off scot free because instead of killing his victim outright he inflicts an injury that is likely though not certain to shorten the victim's life.'

McMackin v. Johnson County Healthcare Ctr., supra at 1099, quoting DePass v. United States, 721 F.2d 203, 208 (7th Cir. 1983) (Posner, J., dissenting). See Roberts v. Ohio Permanente Med. Group, Inc., 76 Ohio St. 3d 483, 488 (1996), rev'g Cooper v. Sisters of Charity of Cincinnati, Inc., 27 Ohio St. 2d 242 (1971) ("Rarely does the law present so clear an opportunity to correct an unfair situation as does this case before us. The time has come to discard the traditionally harsh view we previously followed and to join the majority of states that have adopted the loss-of-chance theory").

Courts adopting the loss of chance doctrine also have noted that, because a defendant's negligence effectively made it impossible to know whether the person would have achieved a more favorable outcome had he received the appropriate standard of care, it is particularly unjust to deny the person recovery for being unable "to demonstrate to an absolute certainty what would have happened in circumstances that the wrongdoer did not allow to come to pass." Hicks v. United States, 368 F.2d 626, 632 (4th

Cir. 1966).

Despite general agreement on the utility of the loss of chance doctrine, however, courts adopting it have not approached loss of chance in a uniform way.²⁸ See Annot., Medical Malpractice: "Loss of Chance" Causality, 54 A.L.R.4th 10 (1987 & Supp. 2008) (encyclopedic discussion of cases adopting distinct approaches). The unsettled boundaries of the doctrine have left it open to criticisms similar to those that the defendants have leveled here: that the loss of chance doctrine upends the long-standing preponderance of the evidence standard; alters the burden of proof in favor of the plaintiff; undermines the uniformity and predictability central to tort litigation; results in an expansion of liability; and is too complex to administer. See generally T.A. Weigand, Loss of Chance in Medical Malpractice: The Need for Caution, 87 Mass. L. Rev. 3 (2002); D.A. Fischer, Tort Recovery for Loss of a Chance, 36 Wake Forest

²⁸ Some courts have relied on § 323 of the Restatement (Second) of Torts (1965) in recognizing loss of chance. See, e.g., DeBurkarte v. Louvar, 393 N.W.2d 131, 135 (Iowa 1986); McKellips v. St. Francis Hosp., Inc., 741 P.2d 467, 474-475 (Okla. 1987); Hamil v. Bashline, 481 Pa. 256 (1978). We are in accord with the position taken by the Draft Restatement, supra at § 26, Reporters' Note to comment n, that this reliance is misplaced. Section 323 of the Restatement (Second) imposes a duty of reasonable care on the part of those who "undertake[], gratuitously or for consideration, to render services to another," and imposes liability on such persons for "harm resulting" when "failure to exercise such care increases the risk of such harm." Id. However, § 323 is silent on the question whether loss of chance itself is a form of harm. The placement of § 323 in Topic 7, "Duties of Affirmative Action," rather than in a topic concerning harm or causation, illustrates that § 323 is not an appropriate source for the doctrine of loss of chance. Id.

L. Rev. 605 (2001). See also Smith v. Parrott, 833 A.2d 843, 847-849 (Vt. 2003); Fennell v. Southern Maryland Hosp. Ctr., Inc., 320 Md. 776, 789-784 (1990). While these objections deserve serious consideration, the doctrine of loss of chance, when properly formulated, survives these criticisms.

Addressing the specific arguments advanced by the defendants is useful for delineating the proper shape of the doctrine. The defendants argue that the loss of chance doctrine "lowers the threshold of proof of causation" by diluting the preponderance of the evidence standard that "has been the bedrock of the Massachusetts civil justice system." Some courts have indeed approached the issue of how to recognize loss of chance by carving out an exception to the rule that the plaintiff must prove by a preponderance of the evidence that the defendant "caused" his injuries. See, e.g., Thompson v. Sun City Community Hosp., Inc., 141 Ariz. 597, 607-608 (1984) (adopting rule that "permits the case to go to the jury on the issue of causation with less definite evidence of probability than the ordinary tort case," and requiring jury to "find for the defendant unless they find a probability that defendant's negligence was a cause of plaintiff's injury" [emphasis in original]). We reject this approach. "It is fundamental that the plaintiff bears the burden of establishing causation by a preponderance of the evidence." Johnson v. Summers, 411 Mass. 82, 91 (1991). Therefore, in a case involving loss of chance, as in any other negligence context, a plaintiff must establish by a preponderance of the

evidence that the defendant caused his injury.

However, "injury" need not mean a patient's death. Although there are few certainties in medicine or in life, progress in medical science now makes it possible, at least with regard to certain medical conditions, to estimate a patient's probability of survival to a reasonable degree of medical certainty. See Herskovits v. Group Health Coop. of Puget Sound, 99 Wash. 2d 609, 616 (1983); King I, supra at 1386-1387. See also Glicklich v. Spievack, 16 Mass. App. Ct. 488, 494-495 (1983). That probability of survival is part of the patient's condition. When a physician's negligence diminishes or destroys a patient's chance of survival, the patient has suffered real injury. The patient has lost something of great value: a chance to survive, to be cured, or otherwise to achieve a more favorable medical outcome. See Herskovits v. Group Health Coop. of Puget Sound, supra at 618, quoting James v. United States, 483 F. Supp. 581, 587 (N.D. Cal. 1980) ("no one can say that the chance of prolonging one's life or decreasing suffering is valueless"). Thus we recognize loss of chance not as a theory of causation, but as a theory of injury. See Alexander v. Scheid, 726 N.E.2d 272, 279 (Ind. 2000) ("loss of chance is better understood as a description of the injury than as either a term for a separate cause of action or a surrogate for the causation element of a negligence claim"); Jorgenson v. Vener, 616 N.W.2d 366, 371 (S.D. 2000) ("The key to a successful application of this doctrine is recognizing and valuing the lost chance as the compensable injury

. . .").²⁹

Recognizing loss of chance as a theory of injury is consistent with our law of causation, which requires that plaintiffs establish causation by a preponderance of the evidence. See Johnson v. Summers, supra at 91. See also Woronka v. Sewall, 320 Mass. 362, 365 (1946). In order to prove loss of chance, a plaintiff must prove by a preponderance of the evidence that the physician's negligence caused the plaintiff's likelihood of achieving a more favorable outcome to be diminished. That is, the plaintiff must prove by a preponderance of the evidence that the physician's negligence caused the plaintiff's injury, where the injury consists of the diminished likelihood of achieving a more favorable medical outcome. See Jorgenson v. Vener, supra ("Properly applied, the loss of chance doctrine does not alter or eliminate the requirement of proximate causation. Rather, a plaintiff must still prove by a preponderance of evidence, or more likely than not, that the defendant's actions reduced her chance of a better outcome"); King, Jr., "Reduction of Likelihood" Reformulation and Other Retrofitting of the Loss-of-a-Chance Doctrine, 28 U. Memphis L. Rev. 491, 492 (1998) (King II). The loss of chance doctrine, so delineated, makes no

²⁹ The Draft Restatement points out that "recognizing lost opportunity as harm is preferable to employing a diluted substantial-factor or other factual-causation test, thereby leaving recovery to the unconstrained inclination of any given jury and providing some fortunate plaintiffs with a full measure of damages for their physical harm while denying any recovery to others." Draft Restatement, supra at § 26 comment n.

amendment or exception to the burdens of proof applicable in all negligence claims.³⁰

We reject the defendants' contention that a statistical likelihood of survival is a "mere possibility" and therefore "speculative." The magnitude of a probability is distinct from the degree of confidence with which it can be estimated. A statistical survival rate cannot conclusively determine whether a particular patient will survive a medical condition. But survival rates are not random guesses. They are estimates based on data obtained and analyzed scientifically and accepted by the relevant medical community as part of the repertoire of diagnosis and treatment, as applied to the specific facts of the plaintiff's case. See Glicklich v. Spievack, supra at 494 n.4 (recognizing established use of clinical staging systems for cancer in medical prognoses). Where credible evidence establishes that the plaintiff's or decedent's probability of survival is 49%, that conclusion is no more speculative than a conclusion, based on similarly credible evidence, that the probability of survival is 51%.

³⁰ The defendants claim that "any percent loss of chance below 50% . . . would fundamentally shift the burden of proof from the plaintiff to the defendant" because "the only avenue of defense for the physician to escape liability is to establish with certainty that the negligence caused no harm." As we have implemented it, the loss of chance doctrine works no such shift in the burden of proof. The burden remains on the plaintiff to show that the physician's negligence more likely than not caused the plaintiff's injury. See Perez v. Las Vegas Med. Ctr., 107 Nev. 1, 6 (1991) ("By defining the injury as the loss of chance of survival, the traditional rule of preponderance is fully satisfied").

The defendants also point out that "[t]he cause, treatment, cure and survivability related to cancer is tremendously uncertain and complex," and argue that loss of chance is "rife with practical complexities and problems." Such difficulties are not confined to loss of chance claims. A wide range of medical malpractice cases, as well as numerous other tort actions, are complex and involve actuarial or other probabilistic estimates. Wrongful death claims, for example, often require, as part of the damages calculation, an estimate of how long the decedent might have lived absent the defendant's conduct. The calculation of damages in a claim for lost business opportunities may be similarly complex. See, e.g., Roblin Hope Indus., Inc. v. J.A. Sullivan Corp. (No. 2), 11 Mass. App. Ct. 76, 79 (1980).³¹

The key is the reliability of the evidence available to the fact finder. In earlier periods, Massachusetts courts grappling with what we would now call loss of chance claims often lacked reliable expert evidence of what the patient's chances of survival or recovery would have been absent the alleged negligence. See, e.g., Wright v. Clement, 287 Mass. 175, 176 (1934) (affirming directed verdict for defendant despite evidence

³¹ Determining causation under the "all or nothing" rule involves a similar use of statistical evidence. See Jorgenson v. Vener, 616 N.W.2d 366, 371 (S.D. 2000), quoting King I, supra at 1385 ("[A]lthough the doctrine [of loss of chance] relies on statistical evidence in order to assign a value to the lost chance, such use of mathematical calculations is already necessary under the traditional standards of causation and valuation. As Professor King points out, 'How else . . . do we even know whether we are talking about a better-than-even chance when applying the all-or-nothing rule?'").

of negligent failure to diagnose scarlet fever and negligence in moving decedent from maternity ward because "there is nothing to show any probability that [the patient] would have recovered or lived longer or suffered less, if due care had been used"). More recently, as we noted above, at least for certain conditions, medical science has progressed to the point that physicians can gauge a patient's chances of survival to a reasonable degree of medical certainty, and indeed routinely use such statistics as a tool of medicine. See note 15, supra. Reliable modern techniques of gathering and analyzing medical data have made it possible for fact finders to determine based on expert testimony -- rather than speculate based on insufficient evidence -- whether a negligent failure to diagnose a disease injured a patient by preventing the disease from being treated at an earlier stage, when prospects were more favorable. See Cusher v. Turner, 22 Mass. App. Ct. 491, 498 (1986) (upholding verdict against physician for negligent failure to diagnose ovarian cancer, on theory that "if such tests had been ordered . . . the cancer would have been discovered and removed, preventing its spread throughout the plaintiff's body"); Glicklich v. Spievack, supra at 494-495 (reversing judgment notwithstanding verdict for defendant where there was expert evidence that negligent failure to diagnose patient's breast cancer caused cancer to progress from "Stage I," in which her chances of surviving ten years with proper treatment would have been 94%, to "stage II," in which her chances of surviving ten years with proper treatment were

"50% or less"). The availability of such expert evidence on probabilities of survival makes it appropriate to recognize loss of chance as a form of injury.³² Cf. Wright v. Clement, supra. See also Aasheim v. Humberger, 215 Mont. 127, 133 (1985) (noting that loss of chance "recognizes the realities inherent in medical negligence litigation"). Through appropriate expert evidence, a plaintiff in a medical malpractice case may be able to sustain her burden of showing that, as a result of defendant's negligence, a decedent suffered a diminished likelihood of achieving a more favorable medical outcome.

We are unmoved by the defendants' argument that "the ramifications of adoption of loss of chance are immense" across "all areas of tort." We emphasize that our decision today is limited to loss of chance in medical malpractice actions.³³ Such cases are particularly well suited to application of the loss of chance doctrine. See Restatement (Third) of Torts: Liability

³² Juries have, over time, heard increasingly sophisticated statistical epidemiological evidence in a variety of cases. The defendants argue that recognizing loss of chance undermines the "uniformity and predictability" of tort law. We do not agree. To the extent that evidence of the loss of chance is based on reliable expert testimony about accepted medical data, as it must be, permitting recovery for loss of chance damages does nothing to make our laws of medical malpractice less uniform or predictable than they are in the ordinary course.

³³ We do not decide today whether a plaintiff may recover on a loss of chance theory when the ultimate harm (such as death) has not yet come to pass. Compare King II, supra at 544 (arguing against allowing recovery for future harms, and arguing instead for modifying statutes of limitations to accommodate claims regarding future harms after those harms materialize), with Alexander v. Scheid, 726 N.E.2d 272, 277-281 (Ind. 2000), and cases cited (allowing recovery on such theory).

for Physical Harm § 26 comment n (Proposed Final Draft No. 1, 2005) comment n (Draft Restatement). First, as we noted above, reliable expert evidence establishing loss of chance is more likely to be available in a medical malpractice case than in some other domains of tort law. Id. Second, medical negligence that harms the patient's chances of a more favorable outcome contravenes the expectation at the heart of the doctor-patient relationship that "the physician will take every reasonable measure to obtain an optimal outcome for the patient." Id. See K.S. Abraham, *Forms and Functions of Tort Law* 117-118 (3d ed. 2007) (discussing argument that "health care providers undertake to maximize a patient's chances of survival, [and so] their failure to do so should be actionable. Ordinary actors who negligently risk causing harm have not undertaken such a duty"). Third, it is not uncommon for patients to have a less than even chance of survival or of achieving a better outcome when they present themselves for diagnosis, so the shortcomings of the all or nothing rule are particularly widespread. Finally, failure to recognize loss of chance in medical malpractice actions forces the party who is the least capable of preventing the harm to bear the consequences of the more capable party's negligence. See Draft Restatement, supra at 326 comment n.

In sum, whatever difficulties may attend recognizing loss of chance as an item of damages in a medical malpractice action, these difficulties are far outweighed by the strong reasons to adopt the doctrine. We turn now to the defendants' argument that

the wrongful death statute, G. L. c. 229, § 2, does not allow for loss of chance.

3. Wrongful death statute. The wrongful death statute imposes liability on anyone who "by his negligence causes the death of a person." G. L. c. 229, § 2. The defendants contend that the language of the statute "causes the death" precludes loss of chance claims and allows only claims that the defendant was a but-for cause of the decedent's death. This interpretation is not required by the wrongful death statute.

The purpose of the wrongful death statute is "to compensate a decedent's survivors for the loss of the decedent's life." Thibert v. Milka, 419 Mass. 693, 695 (1995). The origin of wrongful death actions in Massachusetts can be traced to England, where such actions are said to have sprung from "the ancient custom of compensating for wrongfully inflicted death." S.M. Speiser & J.E. Rooks, Jr., Recovery for Wrongful Death § 1.1 (4th ed. 2005 & Supp. 2007). "In the very early days of the Anglo-Saxons, homicide in all forms was regarded as a civil offense, a private wrong. In order to prevent feuds among clannish groups and to encourage peace, what we now call 'damages' for the killing of a person were payable to the deceased's relatives." Id. at § 1:3. When the earliest colonists arrived in what is now Massachusetts, they brought with them and embraced as their own common law the wrongful death cause of action. See id. at § 1.4, and cases cited ("the Massachusetts courts during the colonial

period had consistently allowed compensation in death cases.³⁴

In the early Nineteenth Century, however, the common-law development of wrongful death actions was sidetracked by a single English decision, later repudiated by this court. In 1808, in Baker v. Bolton, 1 Campb. 493 (1808), a case involving a husband's suit against owners of a stagecoach that had overturned, killing his wife, Lord Ellenborough, an English judge, stated that "in a civil court, the death of a human being could not be complained of as an injury." See S.M. Speiser & J.E. Rooks, Jr., *Recovery for Wrongful Death*, supra at § § 1.1, 1.2; Gaudette v. Webb, 362 Mass. 60, 68 (1972). For various reasons that do not concern us here, Lord Ellenborough's dictum quickly came to stand for the proposition, in both English and American courts, including this court, that no cause of action for wrongful death existed apart from statute. See, e.g., Carey v. Berkshire R.R., 1 Cush. 475, 478 (1848), citing Baker v. Bolton, supra (holding that "the death of a human being is not the ground of an action for damages").

Even as it was being cited as authority, however, Lord Ellenborough's rule came under harsh criticism from courts and scholars as both unfounded and barbaric. See Gaudette v. Webb,

³⁴ The earliest wrongful death statute in what is now the Commonwealth is Province Laws 1693-1694, c. 6, § 6, which made municipalities liable for damages to a decedent's relatives when the person's death was caused by "a defect in a highway, causeway or bridge." See Gaudette v. Webb, 362 Mass. 60, 66 n.4 (1972) (summarizing history of wrongful death statutes in Massachusetts).

supra at 69-71. In Moragne v. States Marine Lines, Inc., 398 U.S. 375 (1970), the United States Supreme Court rejected Lord Ellenborough's dictum and held that a common-law action for wrongful death could be brought under United States maritime law. After a thorough and detailed historical discussion, the Supreme Court concluded that "the history of the common-law rule indicates that [Lord Ellenborough's rule] was based on a particular set of factors that [have] long since been thrown into discard even in England, and that had never existed in this country at all." Id. at 381.³⁵ Reasoning that where a duty exists at common law, "nothing in ordinary notions of justice suggests that a violation should be nonactionable simply because it was serious enough to cause death," id., the Court therefore rejected Lord Ellenborough's rule and held as a matter of common law that one may bring a wrongful death action under general maritime law. Although the Federal Death on the High Seas Act, 46 U.S.C. §§ 761, 762 (as then codified), did not expressly provide any remedy for the wrongful death at issue in the case,³⁶

³⁵ Lord Ellenborough's dictum likely derived from the felony-merger doctrine, according to which a felon was put to death and his property forfeited to the Crown, thereby removing from the reach of civil law both the defendant and any property from which to pay damages. See Moragne v. States Marine Lines, Inc., 398 U.S. 375, 382-383 (1970). Although in limited instances American law held that a civil trial could not proceed until after the criminal trial, "felony punishment [in the United States] did not include forfeiture of property." Id. at 384. Therefore, "[t]he historical justification marshaled for the rule in England never existed in this country." Id.

³⁶ The Federal Death on the High Seas Act, 46 U.S.C. §§ 761, 762 (as then codified), allowed for recovery only for deaths on

the Court held that act was never meant to preempt the "evolving duty of seaworthiness" from which the courts would recognize a common-law action for wrongful death. See id. at 399-400.

In Gaudette v. Webb, supra, this court, relying in part on the Moragne case, put Lord Ellenborough's mischief to rest in the Commonwealth. Rejecting the authority of Lord Ellenborough's dictum, we held that "the law in this Commonwealth has . . . evolved to the point where it may now be held that the right to recovery for wrongful death is of common law origin, and we so hold." Id. at 71. In holding that wrongful death claims existed at common law, this court concluded that claims under the wrongful death statute are common-law claims that continue to evolve, even as the wrongful death statutes impose certain procedural requirements on such claims. See Id. at 71-72.

"[O]ur wrongful death statutes will no longer be regarded as 'creating the right' to recovery for wrongful death. They will be viewed rather as: (a) requiring that damages recoverable for wrongful death be based upon the degree of the defendant's culpability; (b) prescribing the range of damages recoverable against each defendant; (c) requiring that any action for wrongful death be brought by a personal representative on behalf of the designated categories of beneficiaries; and (d) requiring that the action be commenced within a specified period of time, as a limitation upon the remedy and not upon the right."

Id. at 71. Thus, in Gaudette v. Webb, supra, we allowed a wrongful death claim to be brought under the wrongful death statute where the terms of the statute did not provide the plaintiff with any right to recover. Id. at 71-73.

the high seas. The death in the Moragne case occurred in territorial waters. Id. at 376.

Like all common-law causes of action, our common law of wrongful death evolves to meet changes in the evolving life of the Commonwealth. See Sullivan v. Boston Gas Co., 414 Mass. 129, 134 (1993) ("Sound principles of common law evolve out of the interaction of the infinite variety of new patterns of human activity with principles crafted in response to already-experienced situations"); Gaudette v. Webb, supra. Although wrongful death did not traditionally encompass loss of chance of survival, we conclude that claims for loss of chance of survival are sufficiently akin to wrongful death claims as to be cognizable under the wrongful death statute, which governs the procedural requisites for such claims. See Gaudette v. Webb, supra at 71.³⁷ Now that medical science has developed credible

³⁷ Other States have considered the question whether their own wrongful death statutes allow for recovery under a loss of chance theory. Many have found, for differing reasons, that they do. See, e.g., Cahoon v. Cummings, 734 N.E.2d 535, 539-540 (Ind. 2000); Perez v. Las Vegas Med. Ctr., 107 Nev. 1 (1991); McKellips v. Saint Francis Hosp., Inc., 741 P.2d 467 (Okla. 1987); Hamil v. Bashline, 481 Pa. 256 (1978); McMackin v. Johnson County Healthcare Ctr. 73 P.3d 1094 (Wyo. 2004). But see United States v. Cumberbatch, 647 A. 2d 1098 (Del. 1994) (loss of chance not actionable under State wrongful death statute; Joshi v. Providence Health Sys. of Or. Corp., 342 Or. 152 (2006) (same).

One State's high court has held that loss of chance claims are cognizable under that State's survival statute, which explicitly provides for the survival of "causes of action for death," Mo. Rev. Stat. § 537.020 (1986) ("Action for personal injury or death to survive regardless of death of either party"), but are not cognizable under the State's wrongful death statute on the grounds that statistical evidence does not "prove that decedent's death resulted from the failure to properly diagnose and treat." Wollen v. DePaul Health Ctr., 828 S.W.2d 681, 686 (Mo. 1992). The court's reasoning relies on the idea that the injury involved in a loss of chance of survival case is death, rather than the loss of chance itself. We do not so hold. In

methods of quantifying the extent to which the malpractice damaged the patient's prospects for survival, and in light of the strong public policy favoring compensation for victims of medical malpractice and the deterrence of deviations from appropriate standards of care, loss of chance of survival rightly assumes a place in our common law of wrongful death, and we so hold.³⁸

The development of our law of wrongful death to encompass loss of chance of survival claims is entirely consistent with this court's holding in Gaudette v. Webb, 362 Mass. 60, 71

any event, in Massachusetts, a loss of chance claim brought under our survival statute, G. L. c. 228, § 1, rather than our wrongful death statute, would not appear to allow recovery for "the reasonably expected net income, services, protection, care, assistance, society, companionship, comfort, guidance, counsel, and advice of the decedent." G. L. c. 229, § 2. See Hallett v. Wrentham, 398 Mass. 550, 556 (1986) ("We conclude that the wrongful death act, G. L. c. 229, § 2, provides the exclusive action for the recovery of the damages it encompasses by the designated beneficiaries"). Such a result would hardly be consistent with principles of fairness and deterrence.

³⁸ Because all human beings eventually die, an ordinary wrongful death claim is in effect a claim that the defendant's conduct brought on the death of the decedent sooner than it would otherwise have occurred; this is particularly so in the area of wrongful death claims based on alleged medical malpractice, because the relevant relationship between the decedent and the defendant physician or other health professional was formed as a result of, or concerned, a disease or illness on the part of the decedent. The damages calculation in an ordinary wrongful death case thus often involves estimating the life expectancy that a decedent would have enjoyed, absent the wrongful conduct of the defendant that caused the decedent's untimely death. See, e.g., Durdle v. Baron, 328 Mass. 460, 463 (1952); Lane v. Meserve, 20 Mass. App. Ct. 659, 666 (1985). In a loss of chance wrongful death case, the logic is similar: a plaintiff must show that her prospects for survival were diminished from what they would otherwise have been, and the magnitude of that diminution will determine damages. See part 4. infra.

(1972),³⁹ that the wrongful death statute will be viewed in part as "requiring that damages recoverable for wrongful death be based upon the degree of the defendant's culpability." Our method of calculating loss of chance damages furthers and refines this requirement. Moreover, it remedies the illogical and harsh results of a rule that would permit a person who had a prenegligence chance of survival of 51% to recover full damages while denying all recovery to the person whose prenegligence chance of survival was 49%.

We turn now to the proper measure of damages in a loss of chance medical malpractice case.

4. Damages. Our conclusion that loss of chance is a separate, compensable item of damages in an action for medical malpractice does not fully resolve the issues on appeal. We must consider, among other things, how the loss of the likelihood of a more favorable outcome is to be valued. The first question is what is being valued. In this case, the patient's prospects for achieving a more favorable outcome were measured in terms of the patient's likelihood of surviving for a number of years specified by the relevant medical standard: for gastric cancer, the five-year survival rate.⁴⁰ There is no single measure that will apply

³⁹ Nothing in our decision today disturbs the other requirements of the wrongful death statute enumerated in Gaudette v. Webb, supra at 71, including requirements regarding who may bring the action; when it must be commenced; and the range of damages that may be recovered from each defendant.

⁴⁰ The jury found that Matsuyama had stage 2 gastric cancer when he first consulted Birnbaum, and that he had a [37.5%]

uniformly to all medical malpractice cases. See, e.g., Renzi v. Paredes, post , (2008) (employing ten-year survival metric for breast cancer); Alexander v. Scheid, 726 N.E.2d 272, 279 (Ind. 2000) (measuring loss of chance damages in terms of "decreased life expectancy," measured in years); DeBurkarte v. Louvar, 393 N.W.2d 131, 135 (Iowa 1986) (employing ten-year survival metric for breast cancer). Precisely what yardstick to use to measure the reduction in the decedent's prospects for survival -- life expectancy, five-year survival, ten-year survival, and so on -- is a question on which the law must inevitably bow to some extent to the shape of the available medical evidence in each particular case. See McMackin v. Johnson County Healthcare Ctr., 73 P.3d 1094, 1100 (Wyo. 2003) (noting that "no clear-cut rule" can govern all measures of damages in loss of chance cases).

A second, more challenging issue is how to calculate the monetary value for the lost chance. Courts adopting the loss of chance doctrine have arrived at different methods for calculating such damages. See generally Mead v. Adrian, 670 N.W.2d 174, 187-189 (Iowa 2003) (Cady, J., concurring specially). The most widely adopted of these methods of valuation is the "proportional damages" approach. See Cahoon v. Cummings, 734 N.E.2d 535, 541 (Ind. 2000), and cases cited (holding that proportional damages is "the better approach"). See also Delaney v. Cade, 255 Kan.

"probability of cure."

199, 217 1994) (proportional damages approach constitutes proper view); McKellips v. Saint Francis Hosp., Inc., 741 P.2d 467, 475-477 (Okla. 1987) (same). Under the proportional damages approach, loss of chance damages are measured as "the percentage probability by which the defendant's tortious conduct diminished the likelihood of achieving some more favorable outcome." King I, supra at 1382. The formula aims to ensure that a defendant is liable in damages only for the monetary value of the portion of the decedent's prospects that the defendant's negligence destroyed. In applying the proportional damages method, the court must first measure the monetary value of the patient's full life expectancy and, if relevant, work life expectancy as it would in any wrongful death case. But the defendant must then be held liable only for the portion of that value that the defendant's negligence destroyed. See King II, supra at 542.

Deriving the damages for which the physician is liable will require the fact finder to undertake the following calculations:⁴¹

⁴¹ These calculations will determine the loss of chance damages. We pause to clarify the issue of damages for pain and suffering, of which there are potentially two kinds. First, a jury could find, on appropriate evidence, that a physician's negligence caused pain and suffering quite apart from the loss of chance. Compensatory damages for this type of pain and suffering should be awarded in the same manner as in any malpractice case; they are not part of the proportional damages calculation.

Second, a jury could find, on appropriate evidence, that the ultimate injury -- in this case, dying of gastric cancer -- involved pain and suffering. This second category of pain and suffering would more likely than not have occurred even absent the physician's negligent conduct. Thus, the physician may only

(1) The fact finder must first calculate the total amount of damages allowable for the death under the wrongful death statute, G. L. c. 229, § 2, or, in the case of medical malpractice not resulting in death, the full amount of damages allowable for the injury. This is the amount to which the decedent would be entitled if the case were not a loss of chance case: the full amount of compensation for the decedent's death or injury.⁴²

(2) The fact finder must next calculate the patient's chance of survival or cure immediately preceding ("but for") the medical malpractice.

(3) The fact finder must then calculate the chance of survival or cure that the patient had as a result of the medical malpractice.

(4) The fact finder must then subtract the amount derived in step 3 from the amount derived in step 2.

be held liable for this pain and suffering to the extent that his negligent conduct diminished the decedent's likelihood of avoiding this outcome. Thus, this second category of pain and suffering is properly subject to the proportional damages calculation set out here.

In this case, the jury awarded \$160,000 in compensatory damages for "the pain and suffering of Kimiyoshi Matsuyama for which the negligence of Neil S. Birnbaum, M.D. was a substantially contributing factor." The judge instructed the jury that this figure was "for the conscious pain and suffering which was endured by Mr. Matsuyama during the period of his illness, if that period was caused by Dr. Birnbaum." While this instruction is not a model of clarity, we read it to refer to the first category of pain and suffering damages set out above: pain and suffering "caused by Dr. Birnbaum." There was sufficient evidence to support the jury's finding, and it was proper for the judge to exclude this pain and suffering from the proportional damages calculus.

Neither party requested jury instructions about additional pain and suffering of the second type (the pain and suffering involved in dying of gastric cancer), which would, on appropriate evidence, have been part of the loss of chance proportional damage calculation set out here.

⁴² Our holding on damages is limited to loss of chance cases. See Renzi v. Paredes, post , (2008).

(5) The fact finder must then multiply the amount determined in step 1 by the percentage calculated in step 4 to derive the proportional damages award for loss of chance.

To illustrate, suppose in a wrongful death case that a jury found, based on expert testimony and the facts of the case, that full wrongful death damages would be \$600,000 (step 1), that the patient had a 45% chance of survival prior to the medical malpractice (step 2), and that the physician's tortious acts reduced the chances of survival to 15% (step 3). The patient's chances of survival were reduced 30% (i.e., 45% minus 15%) due to the physician's malpractice (step 4), and the patient's loss of chance damages would be \$600,000 multiplied by 30%, for a total of \$180,000 (step 5). See, e.g., Mead v. Adrian, supra at 186-187 (Cady, J., concurring specially); McKellips v. Saint Francis Hosp., Inc., 741 P.2d 467, 476 (Oka. 1987).

We are not unmindful of the criticism of the proportional damages approach.⁴³ However, we are in accord with those courts that have determined that the proportional damages method is the most appropriate way to quantify the value of the loss of chance for a more favorable outcome, because it is an easily applied calculation that fairly ensures that a defendant is not assessed

⁴³ See, e.g., Fischer, Tort Recovery for Loss of a Chance, 36 Wake Forest L. Rev. 605, 631-633 (2001) (claiming that proportional damages method fails to advance aims of deterrence because it routinely over or under compensates plaintiffs); Note, Identifying and Valuing the Injury in Lost Chance Cases, 96 Mich. L. Rev. 1335, 1347-1353 (1998) (same).

damages for harm that he did not cause.⁴⁴ See, e.g., Pipe v. Hamilton, 274 Kan. 905, 910 (2002) ("The proportional damage approach ensures that a plaintiff recovers only the loss attributable to the loss of chance and not for an arbitrary amount awarded by the jury or for the total damages sustained"); Roberts v. Ohio Permanente Med. Group, Inc., 76 Ohio St. 3d 483, 489 (1996) (proportional damages approach "provides an equitable method of apportioning damages consistent with the degree of fault attributable to the health care provider. Thus, rather than compensating the plaintiff for all damages allowed in a malpractice or wrongful death action, the defendant is liable only for those damages attributable to his percentage of negligence").

From our analysis thus far, it should be evident that the value of "the loss of opportunity to allow events to play out in order to see if the plaintiff's condition was in fact amenable to restoration," King II, supra at 533, is a matter beyond the average juror's ken; the evidence will necessarily come from experts. Expert testimony is required to ascertain what measure of a more favorable outcome is medically appropriate (for example, five-year survival as in this case), to determine what statistical rates of survival apply in what circumstances, for

⁴⁴ Birnbaum argued in his supplemental trial brief that, if the judge were to permit recovery for the loss of chance, the jury should be instructed on the "apportionate method" only (that is, the proportional damages approach) in order to avoid overcompensating the plaintiff.

example, a 37.5% chance of survival, and to apply these rates to the particular clinical circumstances of the patient.

The defendants protest that such reliance on experts is likely to result in "imprecise" and "skewed" evidence on which to base a damages award. Our response is both general and specific. First, as a general matter, we disavow the defendants' claim that reliance on statistical evidence is "generally disfavored in the law." As we have noted, probabilistic evidence, in the form of actuarial tables, assumptions about present value and future interest rates, statistical measures of future harm, and the like, is the stock-in-trade of tort valuation. See DePass v. United States, 721 F.2d 203, 209-210 (7th Cir. 1983) (Posner, J., dissenting). For decades, judges, lawyers, jurors, and litigants have shown themselves competent to sift through such evidence in a variety of contexts, from mass toxic torts to single-car collisions. Second, in this particular case, all of the medical witnesses testified that the staging of cancer and the use of survival or recovery statistics derived therefrom are common practice with respect to gastric cancer. See note 15, supra. To the extent that expert testimony concerning the statistical likelihood of a more favorable outcome of Matsuyama's condition, or of any medical condition, may manifest a statistical bias or any other indicia of unreliability, that is a matter to be vetted in a pretrial motion to exclude the expert testimony, or at trial on cross-examination, or through the testimony of a defendant's own expert. See Cusher v. Turner, 22 Mass. App. Ct. 491, 498 &

n.9 (1986), citing Glicklich v. Spievack, 16 Mass. App. Ct. 488, 494 n.4 (1983) (in medical malpractice case, "[p]recise evidence as to the 'staging' of the cancer is not required . . ."). See generally King II, supra at 546-547 (successful application of loss of chance doctrine depends on the quality of the appraisal of the decreased likelihood of a more favorable outcome caused by defendants' tortious conduct). Our decision today should not be construed to limit a defendant's right or ability vigorously to challenge the statistical evidence.

We move now to a consideration of the merits.

5. Evidence of causation. As a preliminary matter, we conclude there is no merit to the defendants' argument that the evidence does not support a verdict against Birnbaum for loss of chance. As we stated above, the crux of liability for loss of chance is that Birnbaum's negligence caused a diminution in Matsuyama's likelihood of achieving a more favorable outcome for his medical condition. From the record summarized above, there was ample evidence from which the jury reasonably could conclude that Birnbaum committed a breach of the standard of care by failing to take the necessary steps earlier in his treatment of Matsuyama to determine through appropriate medical testing whether Matsuyama had gastric cancer. The jury were also well within their charge to conclude from the evidence that, but for Birnbaum's breach of care, Matsuyama's chances of survival would

have been greater.⁴⁵ That the jury may have derived their conclusions by crediting the testimony of the plaintiff's expert over the testimony of the defense expert was in the normal course of their acting as a jury.⁴⁶

The defendants claim that the evidence was insufficient to show that, as the judge instructed the jury, "an act or omission of Birnbaum was a substantially contributing factor to the death of Mr. Matsuyama." The "substantial contributing factor" test is useful in cases in which damage has multiple causes, including but not limited to cases with multiple tortfeasors in which it may be impossible to say for certain that any individual defendant's conduct was a but-for cause of the harm, even though it can be shown that the defendants, in the aggregate, caused the harm.⁴⁷ The substantial contributing factor test is less

⁴⁵ Both Peppercorn and Fuchs testified that gastric cancer does not always proceed through the numbered stages in a sequential manner. Nevertheless, the jury were entitled to believe Finkel's explanation that Matsuyama's cancer was at an early stage in July, 1995, when he first saw Birnbaum, and thus more susceptible to treatment at that time, over Peppercorn's explanation that Matsuyama's gastric cancer was of an unusual type that essentially is asymptomatic until stage 4.

⁴⁶ The defense, among other things, faults Finkel for not providing more certain testimony about when Matsuyama would have died absent Birnbaum's negligence. Because Birnbaum's own negligence was the reason that Matsuyama's fate (but for the negligence) is ultimately unknowable, this charge avails the defense nothing. See Hicks v. United States, 368 F.2d 626, 632 (4th Cir. 1966) (plaintiff in loss of chance case should not be required "to demonstrate to an absolute certainty what would have happened in circumstances that the wrongdoer did not allow to come to pass").

⁴⁷ For example, in O'Connor v. Raymark Indus., 401 Mass. 586, 587 (1988), an asbestos case in which the plaintiff's tort

appropriate, however, as an instruction as to cause in a loss of chance case in which one defendant's malpractice alone is alleged to have caused the victim's diminished likelihood of a more favorable outcome.⁴⁸ The proper test in a loss of chance case concerning the conduct of a single defendant is whether that conduct was the but-for cause of the loss of chance.

In the circumstances of this case, the judge's use of the "substantial contributing factor" test did not prejudice the defendant. Requiring the plaintiff to prove that the negligence was a substantial contributing factor in Matsuyama's death -- rather than merely requiring the plaintiff to prove that the negligence reduced Matsuyama's chance of survival -- arguably imposed a heightened burden of proof on the plaintiff. Indeed,

claims against sixteen of the seventeen defendants had been settled, this court approved a special jury question asking whether the one remaining defendant's products "cause[d], or did it substantially contribute to cause, mesothelioma in [the decedent], and did it cause his death?" The judge in that case explained to the jury, "There can be and often are more than one cause present to produce an injury, and more than one person legally responsible for an injury or disease, so here, even if other manufacturers of asbestos-containing products were at fault, and their products contributed to [the decedent's] disease, [the defendant] is not thereby relieved from liability" *Id.* at 589. The Draft Restatement, *supra* at 526 comment j, explains that the "'substantial-factor'" test "originated in the Restatement of Torts §§ 431-432 and was replicated in the Restatement Second of Torts §§ 431-432. Its primary function was to permit the factfinder to decide that factual cause existed when there were overdetermined causes -- each of two separate causal chains sufficient to bring about the plaintiff's harm, thereby rendering neither a but-for cause."

⁴⁸ Although there are two defendants in this case, only Birnbaum's conduct is at issue. Medical Associates's liability is vicarious. See note 22, *supra*.

it was Medical Associates, not the plaintiff, who proposed jury instructions incorporating the test that the "negligence was a substantial contributing cause of the alleged injury." The judge also clarified the "substantial contributing factor" instruction in a way that, while somewhat inartful, suggested that the jury should understand "substantial contributing factor" as indicating that the plaintiff was required to show that Birnbaum's negligence caused a loss of chance of survival. The judge instructed the jury that the word "substantial" "doesn't mean that Mr. Matsuyama's chance of survival was fifty percent or greater, only that there was a fair chance of survival or cure had Dr. Birnbaum not been negligent and had he conformed to the applicable standard of care." The judge's formulation did not use the words "but-for cause," but his definition of "substantial" clearly focused the jury's attention on the idea that Birnbaum's negligence, if any, had to be a but-for cause of Matsuyama's losing a "fair chance of survival."⁴⁹

We turn now to the defendants' claims of error in the jury instructions.

6. Jury instructions. a. Valuation. The defendants

⁴⁹ Although not determinative on the issue of the correctness of the jury instructions, we note that in his closing argument, the plaintiff's counsel told the jury: "We do not hold Doctor Birnbaum responsible for Mr. Matsuyama getting cancer. We do hold Doctor Birnbaum responsible for allowing that cancer to progress in the face of multiple understood risk factors and thereby taking away all opportunity for meaningful detection, intervention, treatment, which would have resulted in Mr. Matsuyama having a higher degree of survival rate"

challenge the jury instructions on valuation. Even were we to accept the loss of chance doctrine, the defendants say, and even if the evidence supports a finding against Birnbaum on that issue, the verdict against him must be reversed and the case retried because the judge gave improper instructions on valuation. While two instructions in particular were less than ideal, reversal is not required.⁵⁰

We do not agree that the judge's instructions and special jury verdict "forced the jury to find a loss of chance and precluded the defense from arguing that there was no loss of a substantial chance of survival based on the evidence." The defendants' focus here is on question 6 of the special jury questions, in particular the "Note" included in that question, and the judge's related instructions. That special jury question included survival rates for each stage of gastric cancer.^{51,52} We

⁵⁰ It is obvious from the record that the judge made a most thoughtful effort to frame the jury instructions and the special questions in the manner best suited to the novel question of law before him, and he is to be commended for it.

⁵¹ Question 6 of the special jury questions was preceded by a question asking the jury to find whether Birnbaum's negligence was "a substantial contributing factor in causing the death of Kimiyoshi Matsuyama." The jury answered "Yes." They then continued to question 6, which stated in part:

"What amount of damages will fully and fairly compensate [Matsuyama's widow] and [Matsuyama's son] for the loss to them of the expected net income, services, protection, care, assistance, society, companionship, comfort, guidance, counsel and advice of her husband and his father, Kimiyoshi Matsuyama, from the date of his death, October 21, 1999, through such period of time you find Kimiyoshi Matsuyama would have survived but for the negligence of Neil S. Birnbaum, M.D. which you find was a

agree with the defendants that the determination of chance of survival was for the jury to decide, based on the conflicting evidence before them, and should not have been included in the special question.⁵³ It will generally not be necessary for the judge to marshal such evidence for the jury.

However, viewing the instructions as a whole, we conclude that the jury charge did not overstep the judge's broad

substantially contributing factor to the death of Kimiyoshi Matsuyama?

"Please note: In arriving at this figure, if you find that the negligence of Neil S. Birnbaum which was a substantially contributing factor to the death of Kimiyoshi Matsuyama first occurred while Kimiyoshi Matsuyama was suffering from so-called "Stage I" adenocarcinoma, you must multiply your damage figure by a percentage figure by or between .6 (60%) and .9 (90%), in your sole discretion. If so-called "Stage 2" adenocarcinoma, by or between .25 (25%) and .5 (50%) in your sole discretion. If so-called "Stage 3" adenocarcinoma, by or between .1 (10%) and .2 (20%) in your sole discretion. If so-called "Stage 4" adenocarcinoma, by or between any positive, whole number, percentage between .01 (1%) and .05 (5%) in your sole discretion" (emphasis in original).

⁵² The judge explained to the jury:

"[W]hat I've done is I've taken what I understood [the stage-specific probability of cure] to have been, and it's your recollection, but what I have understood to have been the low range of probability of cure suggested from the testimony of the medical experts and the high range with respect to each of the stages.

"And so what you need to do is determine what stage and what was the probability of a cure at that stage based on the synthesis that I've given you in your verdict slip."

⁵³ We refer here only to the issue of determining the patient's chances of survival before and after the alleged negligence. A judge is not precluded from instructing the jury about differentiating loss of chance damages from wrongful death damages, or any other matter.

discretion to fashion jury instructions. See Cahalane v. Proust, 333 Mass. 689, 692 (1956); General Dynamics Corp. v. Federal Pac. Elec. Co., 20 Mass. App. Ct. 677, 684 (1985). "Our decisions have consistently upheld the action of trial judges in putting before the jury possible conclusions warranted by the evidence in language that is 'comprehensively strong, rather than hesitatingly barren, or ineffective.'" Cahalane v. Proust, *supra* at 692-693, quoting Whitney v. Wellesley & Boston St. Ry., 197 Mass. 495, 502 (1908). Nothing in the judge's instructions or the special questions themselves would indicate to a reasonable juror that the judge was weighing in on the ultimate question of liability or "forcing" the jury to find a certain damages amount, as the defendants maintain. Throughout his jury charge, the judge took pains to emphasize that the jury's view of the evidence is the only view that mattered. Finally, the defendants argued throughout the trial, and forcefully in closing argument, that Matsuyama was in fact not harmed by Birnbaum's actions; there was no indication that any ruling or statement of the judge precluded the defendants from mounting a vigorous defense. The judge's instructions and jury verdict did not impermissibly weigh in on the question of liability.

Further, for the reasons we have stated above, the judge did not commit reversible error in instructing on the viability of loss of chance as an item of damages, and he correctly chose to apply the proportional method to determine damages for Matsuyama's loss of chance. In conformity with the formula we

have set out supra, he also required on the special jury questions that the jury determine full wrongful death damages and the percentage of Matsuyama's chances of survival but for Birnbaum's negligence. We recognize that the judge did not complete the proportional instruction we outlined above. As the defendants point out, the judge did not require the jury to determine Matsuyama's chance of survival as a result of Birnbaum's negligence, and to subtract that figure from Matsuyama's chance of survival prior to the negligence. In terms of the formula discussed supra, the judge correctly instructed the jury as to step 1 and step 2, but omitted steps 3 and 4. This compelled the jury to assume that Birnbaum's negligence (if any) reduced Matsuyama's chances of survival to zero: \$875,000 multiplied by (.375 minus 0) equals \$328,125, the damages awarded for loss of chance. In fact, the conflicting testimony at trial was that as a result of Birnbaum's negligence, Matsuyama had anywhere from 0 to a 5% chance of survival.⁵⁴ The judge should not have removed from the jury's consideration the question whether and to what extent Birnbaum's negligence left Matsuyama with any chance of survival, both critical factors in valuing Matsuyama's lost chance. See Cahalane v. Proust, supra. See also G. L. c. 231, § 81.⁵⁵

⁵⁴ Birnbaum's expert, Peppercorn, testified that at stage 4, a patient's chance of survival was "[p]ractically zero; less than [5%], probably."

⁵⁵ If, properly instructed, the jury had found, most favorably for Birnbaum, that Matsuyama was left with a 5% chance

However, a remand will not be necessary. The record before us shows that both prior to and after the jury instructions, the defendants objected to question 6, not on the ground of the judge's apportionment formula but on more general, and wholly different, grounds.^{56,57} This lack of a specific objection on point is fatal to their detailed objection on appeal. See Flood

of survival after Birnbaum's negligence, the difference in the jury's proportional award here would be \$875,000 multiplied by 32.5% (37.5% minus 5%) for a total award of \$284,375, rather than the \$328,125 awarded by the jury.

⁵⁶ In a bench conference before the jury charge, Birnbaum's counsel made only the following objection: "I also object to the language of Question No. 6" -- the main loss of chance damages question -- "which I would say improperly and inaccurately comments on the evidence." Medical Associates's counsel added, "I just want to be on the record as objecting to Question No. 6 of the verdict slip as well." The judge noted these objections. After the jury charge, the defendants made various other objections. Birnbaum's counsel objected to the instruction on "causation" that the jury "would have to find whether or not there was a fair chance of cure, not necessarily fifty percent. I object to that instruction as being contrary to the law, and I object to, further, anything except that the jury would be required to prove reasonable medical certainty that as a result of what Dr. Birnbaum did or did not do it resulted, caused Mr. Matsuyama's death." The judge, referring to "extensive lobby conferences on that" that had taken place, declined to change his instructions. Medical Associates's counsel also objected to the "fair chance" language and to the lack of a requirement that the jury find the lost chance to be "substantial," see note 58, infra.

⁵⁷ In his supplemental trial brief, received on July 29, 2004, and docketed on August 12, 2004, Birnbaum argued, inter alia, that, if the judge were to permit the jury to determine damages on a loss of chance claim, the judge must instruct the jury on "apportionment method . . . with the most logical being the difference in chance at the time of misdiagnosis versus the chance at the time of actual diagnosis." However, Birnbaum's proposed jury instructions did not include any version of this language, and this argument was not pressed in objection to the judge's jury instructions (although other, different arguments raised in this supplemental trial brief were).

v. Southland Corp., 416 Mass. 62, 66 (1993) ("A general objection to a portion of a charge will not save appellate rights"). The defendants did argue in a supplemental trial brief that if this court were to recognize loss of chance, they should be entitled to an apportionment formula that takes account of the "difference" in likelihood of survival, see note 57, supra. However, the defendants' proposed jury instructions contained no provision for calculating this difference. When the judge charged the jury in a way that lacked such a provision, none of the defendants' numerous objections either before or after the jury charge specifically touched on this issue. See note 56, supra. Nor have the defendants directed our attention to anything that would suggest that their general objections should be understood in context to refer specifically to this issue. Accordingly, we deem it waived. See Neagle v. Massachusetts Bay Transp. Auth., 45 Mass. App. Ct. 345, 348-349 (1998) (where counsel did not request special jury question on particular issue, and did not object to its omission from special jury questions, "this failure resulted in a waiver of the [party's] rights to have the issue . . . submitted to the jury and to raise the issue on appeal").⁵⁸

b. Gross negligence. At the close of evidence, but prior to closing arguments, the judge allowed the plaintiff's oral

⁵⁸ The defendants also argue that the evidence did not support, and that the judge should have required the plaintiff to prove, the loss of a "substantial" chance of survival. We do not hold today that any such requirement must be imposed.

motion to amend her complaint to add a claim against Birnbaum for gross negligence. See note 19, supra. The judge subsequently proceeded to charge the jury on gross negligence.⁵⁹ In response to a special question, the jury found Birnbaum not grossly negligent in his care and treatment of Matsuyama. Nevertheless, Birnbaum asserts on appeal that the judge, by impermissibly commenting on the evidence of gross negligence in his charge to the jury, left jurors with the impression that, at the very least, Birnbaum should be found liable in negligence.⁶⁰ See G. L. c. 231, § 81 ("The courts shall not charge juries with respect to matters of fact, but they may state the testimony and the law"). We disagree.

Where, as here, the judge had determined that the evidence

⁵⁹ In relevant part, the judge stated: "So, that is essentially the rundown of the liability aspect of the case. If I say, if, you should in your discretion at the end of the day conclude that there was liability for negligence, there is evidence in this case, ladies and gentlemen, upon which you have the legal authority to find that Dr. Birnbaum's conduct was, as to loss, grossly negligent. So, I want to tell you basically what the definition of gross negligence is. Gross negligence is evidence which is substantially higher and appreciably higher magnitude than ordinary negligence. It is materially greater want of care under the circumstances with respect to the legal duty that is owed. . . . If it's a relatively small want of inattention which is nonetheless negligent, then so be it. It's a great departure from the obligation of attentiveness and it's gross inattention, then you have the authority in this case to find that Dr. Birnbaum on the facts of this case was negligent. I do not, obviously, suggest to you that you should or you shouldn't. I'm merely telling you that there are facts in which you could make that determination from this case, and that is entirely up to you."

⁶⁰ Birnbaum does not fault the judge's instructions on the elements of a cause of action for gross negligence. See Altman v. Aronson, 231 Mass. 588, 593 (1919).

warranted an instruction on gross negligence, the judge correctly gave such an instruction, which had been requested by the plaintiff. In light of the evidence from expert and other medical witnesses that Birnbaum missed or ignored Matsuyama's known risk factors for gastric cancer for a period of almost four years, as well as Birnbaum's own testimony that the capitation contract he voluntarily entered into caused him "difficulty" in providing patients like Matsuyama with "the best medical care," it was not error for the judge to include instructions on gross negligence.⁶¹ See Altman v. Aronson, 231 Mass. 588, 591-592 (1919) ("The element of culpability which characterizes all negligence is in gross negligence magnified to a high degree as compared with that present in ordinary negligence. Gross negligence is a manifestly smaller amount of watchfulness and circumspection than the circumstances require of a person of ordinary prudence").

Judgment affirmed.

⁶¹ Our decision today should not be construed to suggest that a finding of gross negligence and an award of punitive damages cannot be secured in a loss of chance case. Where gross negligence is found in a loss of chance case, the fact finder will determine an amount of punitive damages exactly as in any other gross negligence case: according to the fact finder's determination of the egregiousness of the tortious conduct or in accordance with any statutorily prescribed amount. Punitive damages are not part of the proportional loss of chance damage calculus.