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Recommended Citation

Brian Kibble-Smith & Arthur W. Hafner, *The Effect of the Information Age on Physicians' Professional Liability*, 36 DePaul L. Rev. 69 (1986)

Available at: <https://via.library.depaul.edu/law-review/vol36/iss1/4>

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THE EFFECT OF THE INFORMATION AGE ON PHYSICIANS' PROFESSIONAL LIABILITY

Brian Kibble-Smith and Arthur W. Hafner***

INTRODUCTION

Computers and related electronic information processing devices are commonplace and relied upon daily by millions of people. Computers are used to control traffic,¹ operate industrial robots,² perform financial transactions,³ and prepare meals.⁴ Computers also provide information. Increasingly, professional and nonprofessional individuals are dependent upon computers and electronics to deliver the information necessary to their occupations.⁵

This article explores the possible effects that the computer and electronic biomedical information management will have on professional liability in health care. Tort liability of physicians and other health care professionals has been the focus of recent attention and has been at the forefront of a national movement for tort reform.⁶ Many states, for example, have enacted laws imposing caps on recovery for pain and suffering, limitations on attorney contingent fees, and structured payouts of awards and settlements.⁷

The computer is a factor in tort liability that is often overlooked by both opponents and advocates of tort reform. The rapidly expanding role of

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1. Wolkomir, *A High-Tech Attack on Traffic Jams Helps Motorists Go With the Flow*, SMITHSONIAN, Apr. 1986, at 42.

2. WHAT CAN BE AUTOMATED? THE COMPUTER SCIENCE & ENGINEERING RESEARCH STUDY (Arden ed. 1980).

3. *Computers Come to the Country*, ILL. BANKER, Mar. 1984, at 18.

4. Pollack, *Technology: The Computer In Restaurants*, N.Y. Times, Mar. 18, 1982, at D2, col. 1.

5. Field & Harris, *The Information Business*, BUS. WK., Aug. 25, 1986, at 82.

6. See, e.g., Harrison, Worth & Carlucci, *The Development of the Principles of Medical Malpractice in the United States*, 29 PERSP. IN BIOLOGY & MED. 41 (1985); *infra* text accompanying note 135.

7. The American Medical Association published an extensive catalog of reforms as an addendum to its August 11, 1986 issue of the newsletter *Professional Liability Update*. As of that date, tort reforms had been enacted in Alaska, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New York, Oklahoma, Rhode Island, South Dakota, Utah, Washington, West Virginia, Wisconsin and Wyoming.

computers in health care professions will continue as information management technology develops. Electronics makes health care more efficient and helps to offset gaps between the need and the availability of health care resources, particularly where access to current information is concerned. As methods of health care practice change in response to the computer, the basic laws and theories of tort liability will soon change in accommodation.

The standard of professional care is an integral part of tort liability based on negligence in patient treatment or physician malpractice. This standard may undergo substantial change in the near future in response to the growing use of electronics in patient care and in the health service professions. In addition, computers may impose greater burdens on the physician's obligation to keep current and their duty of obtaining informed consent. If the law of medical malpractice changes in response to the increased access to information by computer, broader changes in professional liability affecting other information-intensive professions will result.

I. HISTORICAL DEVELOPMENT OF THE STANDARD OF CARE

A claim of "malpractice" against a physician is basically a claim of negligence. As in any negligence suit, the plaintiff has an obligation to prove a duty owed him by the defendant, the defendant's breach of that duty, and the injuries to the plaintiff that are causally related to the defendant's breach.⁸ What separates medical malpractice, or any professional liability suit, from ordinary negligence is the duty to the defendant, or the "standard of care." In ordinary negligence, this duty is determined by the "reasonable person" standard.⁹ Presumably, any judge or juror can apply this standard to assess a defendant's conduct toward a plaintiff.¹⁰ In a professional liability suit,

8. An individual is liable for the negligent invasion of another's interest, if: (a) the interest invaded is protected against unintentional invasion, and (b) the conduct of the actor is negligent with respect to the other, or a class of persons within which he is included, and (c) the actor's conduct is a legal cause of the invasion, and (d) the other has not so conducted himself as to disable himself from bringing an action for such invasion.

RESTATEMENT (SECOND) OF TORTS § 281 (1965).

9. RESTATEMENT (SECOND) OF TORTS § 283 (1965).

10. W. PROSSER, HANDBOOK OF THE LAW OF TORTS § 32 (4th ed. 1971) states:

The courts . . . creat[ed] a fictitious person, who never has existed on land or sea: the "reasonable man of ordinary prudence." Sometimes he is described as a reasonable man, or a prudent man, or a man of average prudence, or a man of ordinary sense using ordinary care and skill. It is evident that all such phrases are intended to mean very much the same thing. The actor is required to do what such an ideal individual would be supposed to do in his place. A model of all proper qualities, with only those human shortcomings and weaknesses which the community will tolerate on the occasion, "this excellent but odious character stands like a monument of our Courts of Justice, vainly appealing to his fellow-citizens to order their lives after his own example."

Id. at 150 (footnotes omitted).

however, the "reasonable person" standard is inapplicable. For example, a prima facie case for medical malpractice includes proof of the standard of care,¹¹ which is usually established through expert testimony.¹²

Historically, the trier of fact was limited in its determination of the standard of care by the "locality rule."¹³ The locality rule originated by implication in early malpractice cases in which courts declined to hold rural physicians to the same standards of skill, learning, and experience as physicians from larger, urban areas.¹⁴ Rural physicians of the time were often isolated from news of medical advancements, new equipment, and opportunities for continuing education. Medical education and standards varied greatly from community to community.¹⁵ As better means to transmit medical information evolved, the rationale for the locality rule began to erode.¹⁶

Courts criticized the locality rule on several grounds. First, it was unfair to limit plaintiffs to a substandard level of expected medical treatment simply because that standard prevailed in the community.¹⁷ Second, in a small com-

11. See 61 AM. JUR. 2D *Physicians, Surgeons & Other Healers* § 348 (1981).

12. W. PROSSER, *supra* note 10, § 32, at 164-65.

13. See Waltz, *The Rise and Gradual Fall of the Locality Rule in Medical Malpractice Litigation*, 18 DEPAUL L. REV. 408 (1969); Comment, *Standard of Care for Medical Practitioners—Abandonment of the Locality Rule*, 60 KY. L.J. 209 (1971); Comment, *An Evaluation of Changes in the Medical Standard of Care*, 23 VAND. L. REV. 729 (1970).

14. See *Small v. Howard*, 128 Mass. 131 (1880), *rev'd*, *Brune v. Belinkoff*, 354 Mass. 102, 235 N.E.2d 793 (1968). See also *Tefft v. Wilcox*, 6 Kan. 33 (1870) (degree of responsibility held to correspond to locality). See *infra* note 69.

15. The North Carolina Supreme Court, in *Wiggins v. Piver*, 276 N.C. 134, 171 S.E.2d 393 (1970), stated:

The "locality rule" (never recognized in England) had its origin in the very old and far away days when there were many little institutions which called themselves medical schools. Students were admitted who could show a high school diploma or furnish a certificate from a school principal that the bearer had completed the "equivalent" of a high school course of study. At the end of the course, he was given an M.D. degree. Passing the licensing board was in the nature of a formality. In many rural communities, ever thereafter the doctor was on his own. Frequent refresher courses, now generally attended, were unknown.

Id. at 139, 171 S.E.2d at 396. In *Kolesar v. United States*, 198 F. Supp. 517 (S.D. Fla. 1961), the court pointed out:

[T]he locality rule of medical standards was originally formulated when communications were slow or virtually non-existent . . . [I]t has lost much of its significance today with the increasing number and excellence of Medical Schools, the free interchange of scientific information, and the consequent tendency to harmonize medical standards throughout the country.

Id. at 521.

16. See, e.g., *Douglas v. Bussabarger*, 73 Wash. 2d 476, 438 P.2d 829 (1968), in which the court stated: "Modern means of transportation permit country doctors to attend up-to-date medical seminars; the general circulation of medical journals makes new developments readily available to them, and they can easily and quickly communicate with the most modern and up-to-date medical centers in cities throughout the United States." *Id.* at 489, 438 P.2d at 837; *infra* text accompanying notes 86-102.

17. See *Gramm v. Boener*, 56 Ind. 497, 501 (1877), *quoted in* *Burk v. Foster*, 114 Ky. 20, 25, 69 S.W. 1096, 1097 (1902).

munity there is a chance that other physicians or specialists would be unavailable or unwilling to testify to the acceptable standard of care.¹⁸ These criticisms led many courts to modify the rule by allowing the plaintiff to present evidence of the standard of care observed in either a "similar" locality, or the "same neighborhood or region," or both.¹⁹

*Moeller v. Hauser*²⁰ exemplifies the similar locality rule. *Moeller* held that the same standard of care was applicable at the Mayo Clinic in Rochester, Minnesota, as in St. Paul, Minnesota.²¹ The advantage of the similar locality rule is that it protects defendant physicians from being compared to physicians in communities of greater resources. However, the similar locality rule has its own deficiencies and has been applied unevenly. Some courts have held that "similar locality" implies a similar locality within the same state.²² Others have held that it means a locality either within the state or within a reasonable distance from and adjacent to state boundaries.²³ Still others have given little or no regard to state boundaries.²⁴ These courts focused on "similarity" as referring to communities similar in terms of medical characteristics.²⁵

A variation of the similar locality rule is the "same neighborhood or region" rule. Under this rule, physicians have been held to the same standard of care demonstrated by physicians in similar practices throughout a contiguous geographical area.²⁶ For example, in *Geraty v. Kaufman*,²⁷ both New London

18. W. PROSSER, *supra* note 10, § 32, at 164.

The well known reluctance of doctors to testify against one another, which has been mentioned now and then in the decisions, may make [expert testimony] difficult or impossible to obtain, and so deprive the plaintiff of any remedy for a real and grievous wrong. In several cities, medical and bar associations are now cooperating to meet the problem by setting up panels of competent and unbiased experts, who will examine the plaintiff, and agree to testify for him if they find there has been negligence.

Id. See Markus, *Conspiracy of Silence*, 14 CLEV.-MAR. L. REV. 520 (1965).

19. See *infra* notes 26-28 and accompanying text.

20. 237 Minn. 368, 54 N.W.2d 639 (1952).

21. *Id.* at 375-76, 54 N.W.2d at 644.

22. See *Tallbull v. Whitney*, 172 Mont. 326, 564 P.2d 162 (1977).

23. See *King v. Murphy*, 424 So. 2d 547, 550 (Miss. 1982), *modified*, *Hall v. Hilbun*, 466 So. 2d 856 (Miss. 1985).

24. See, e.g., *Cavallaro v. Sharp*, 84 R.I. 67, 121 A.2d 669 (1956) (Providence, Rhode Island and Philadelphia, Pennsylvania found to be similar localities).

25. See *Tallbull v. Whitney*, 172 Mont. 326, 564 P.2d 162 (1977). The court in *Tallbull* placed a double limitation on the similar locality rule. It held that the locality that provides the standard, if other than the defendant's practice locality, must be both medically similar and located within the same state. *Id.* at 335, 564 P.2d at 166-67.

26. *Sanson v. Ross-Loos Medical Group*, 57 Cal. App. 2d 549, 552, 134 P.2d 927, 929 (1943); *Jensen v. Findley*, 17 Cal. App. 2d 536, 552, 62 P.2d 430, 435 (1936); *McLennan v. Holder*, 1 Cal. App. 2d 305, 314, 36 P.2d 448, 452 (1934); *Hopkins v. Heller*, 59 Cal. App. 447, 452, 210 P. 975, 977 (1922); *Decho v. Shutkin*, 144 Conn. 102, 105, 127 A.2d 618, 619 (1956); *Geraty v. Kaufman*, 115 Conn. 563, 573-74, 162 A. 33, 36-37 (1932); *Slimak v. Foster*, 106 Conn. 366, 367-68, 138 A. 153, 154 (1927); *Rann v. Twitchell*, 82 Vt. 79, 83, 71 A. 1045, 1046 (1909).

27. 115 Conn. 563, 162 A. 33 (1932).

and New Haven, Connecticut, were held to be within the same "neighborhood." Although the neighborhood rule circumvented many difficulties of the locality rule, "neighborhood" was an ambiguous term for the courts to apply.²⁸

A. *The Standard of Care in Caselaw*

1. *Specialists*

At the turn of the century, medical specialists were rare.²⁹ Because medical knowledge expanded slowly, it was easier for a practicing physician to keep abreast of medical progress. As medical and scientific knowledge expanded more rapidly, and as the center for diagnosis and treatment shifted from the home to the hospital, it became both necessary and convenient for physicians to specialize. The growth of specialized medical practice prompted the creation of medical specialty boards.³⁰

The advent of specialization in medicine significantly affected the determination of the standard of care in malpractice suits. Usually, medical specialists were held to a higher standard of care than their generalist counterparts.³¹ Court rulings minimized the importance of geographical restrictions on the specialist standard of care.³² Many jurisdictions also rejected the locality rule

28. The term "neighborhood" in this sense has been described as: a vicinity or region within a given distance from the community in which the defendant specialist practices. The defendant's community is the center point of a circle and the practices of a specialist within a given radius of that point may be used as evidence in establishing a standard to which the defendant must be held.

Comment, *Standard of Care for Medical Specialists*, 16 ST. LOUIS U.L.J. 497, 502 (1972).

29. 1 THE OXFORD COMPANION TO MEDICINE 767-68 (P. Beeson, R. Scott & J. Walton ed. 1986).

30. Little, *The Founding of the Specialty Boards*, 55 ANESTHESIOLOGY 317 (1981). The first specialty boards were the American Boards of Ophthalmology (founded in 1917), Otolaryngology (1924), Obstetrics and Gynecology (1930), and Dermatology and Syphilology (1932). These boards were followed by the creation of nine additional specialty boards between 1933 and 1938. Specialty boards were established to promote the practice and development of medicine in the specialty area and to protect the public from purported specialists who actually lacked a particular expertise. These boards were also created to establish a national standard of qualifications for specialists, thus preventing states from enacting varying specialty qualifications and standards. *Id.* at 317-18. Eventually, the specialty board movement evolved into the American Board of Medical Specialists, an organization that approves new forms of specialty certification and the creation of new specialty boards. Ferguson & Langsley, *Fifty years of medical specialty certification—role of the American Board of Medical Specialists*, 11 J. AM. ACAD. DERMATOLOGY 911, 913 (1984).

31. See Michaud & Hutton, *Medical Tort Law: The Emergence of a Specialty Standard of Care*, 16 TULSA L.J. 720, 730 (1981); Comment, *The Locality Rule in Medical Malpractice Suits*, 5 CAL. W.L. REV. 124, 124 (1968).

32. See *Francisco v. Parchment Medical Clinic*, 407 Mich. 325, 328, 285 N.W.2d 39, 41 (1979) (per curiam) (standard of care for specialist is national standard, not local one).

as applied to specialists.³³ Yet, derivatives of the locality rule remain vital in many states, even with respect to specialists.

The locality rule may impose geographical restrictions upon the means available to the plaintiff to prove the standard of care by expert testimony. For example, in Idaho, the courts distinguish between those specialists who are board certified and those who are not.³⁴ A non-certified specialist called to establish the standard of care must testify to a knowledge of the local standard of care, but a board-certified specialist is exempt from this requirement.³⁵ In Connecticut, an expert witness must have knowledge of the local standard of care in order to testify.³⁶ Expert witnesses in Tennessee must know the standard of care for practitioners in the locality or in similar communities.³⁷ Therefore, an expert not licensed in Tennessee or a contiguous state cannot testify to the standard of care.³⁸ A Georgia court did not reject the locality rule, but rejected its application where the professional judgment of hospital staff was at issue.³⁹ Finally, Delaware appears to have taken the strongest stand against experts unfamiliar with community standards. Under a "wandering expert" statute, an expert witness must have knowledge of the community standard in order to testify.⁴⁰ However, the Delaware Supreme Court

33. *DeWitt v. Brown*, 669 F.2d 516 (8th Cir. 1982) (applying Arkansas law to find standard of same locality); *May v. Moore*, 424 So. 2d 596 (Ala. 1982) (no longer proper to limit standard of care to locality); *Mann v. Cracchiolo*, 38 Cal. 3d 18, 210 Cal. Rptr. 762, 694 P.2d 1134 (1985) (exercise same skills as others in similar circumstances); *Raitt v. Johns Hopkins Hosp.*, 274 Md. 489, 336 A.2d 90 (1975) (same care as exercised by others in profession); *Brune v. Belinkoff*, 354 Mass. 102, 235 N.E.2d 793 (1968) (standard is not of average member of profession); *Christy v. Saliterman*, 288 Minn. 144, 179 N.W.2d 288 (1970) (locality rule weakened from urbanization and technological advances); *Trapp v. Cayson*, 471 So. 2d 375 (Miss. 1985) (national standard of care same as any other expert); *Wentling v. Jenny*, 206 Neb. 335, 293 N.W.2d 76 (1980) (national standard of care rather than regional); *Simons v. Georgiade*, 55 N.C. App. 483, 286 S.E.2d 596 (standard of care in same or similar communities), *review denied*, 305 N.C. 587, 292 S.E.2d 571 (1982); *King v. Williams*, 279 S.E.2d 618 (S.C. 1981) (standard of care of average competent practitioner acting in same or similar circumstances); *Douglas v. Bussabarger*, 73 Wash. 2d 476, 438 P.2d 829 (1968) (rural doctors held to standard of care of other areas); *Hundley v. Martinez*, 151 W. Va. 977, 158 S.E.2d 159 (1967) (reasons for strict application of locality rule have disappeared).

34. *Buck v. St. Clair*, 108 Idaho 743, 745, 702 P.2d 781, 783 (1985).

35. *Id.* at 745, 702 P.2d at 783. Board certification is also a factor in the District of Columbia. *See Morrison v. MacNamara*, 407 A.2d 555 (D.C. 1979).

36. *Buckley v. Lovallo*, 2 Conn. App. 579, 481 A.2d 1286 (1984). *See also Pisel v. Stamford Hosp.*, 180 Conn. 314, 430 A.2d 1 (1980) (crucial question is not whether expert witness practiced in locale where accident occurred, but whether he knows standard of care in that locale).

37. *Schaefer by Schaefer v. Larsen*, 688 S.W.2d 430 (Tenn. App. 1984).

38. *Id.* at 433. The court reached this decision in reliance on TENN. CODE ANN. § 29-26-115(b) (1980). The portion of the expert's testimony, however, that contained his opinion on the effect of a specific drug used in treatment was admitted because the opinion had "nothing to do with the medical standards of the . . . community." *Schaefer*, 688 S.W.2d at 433.

39. *Macon-Bibb County Hosp. Auth. v. Ross*, 176 Ga. App. 221, 335 S.E.2d 633 (1985).

40. DEL. CODE ANN. tit. 18, § 6854 (Cum. Supp. 1984). *See also Taylor v. Wilmington Medical Center, Inc.*, 577 F. Supp. 309 (D. Del. 1983) (court considered several factors before

has required that "all relevant factors" be considered and balanced under the statute.⁴¹ Therefore, Delaware courts are free to consider whether an expert can testify to a regional or national standard when that standard is the same as the local standard.⁴²

2. *General Practitioners*

Locality rule variations have retained the most vitality in cases of alleged malpractice by general practitioners. Many jurisdictions hold that general practitioners must apply the same degree of skill and care as other practitioners in the same or a similar community.⁴³ This rule is consistent with that of the

permitting experts to testify, including study or attendance at meetings in Delaware, direct observation or care of patients in Delaware, experience teaching in Delaware, knowledge of Delaware journals, and consultation with other doctors in Delaware), *aff'd*, 780 F.2d 1016 (3d Cir. 1985).

41. *Baylis v. Wilmington Medical Center, Inc.*, 477 A.2d 1051 (Del. 1984).

42. *Id.* at 1057.

43. *Titchnell v. United States*, 681 F.2d 165 (3d Cir. 1982) (skill that ordinarily characterizes the profession; applying Pennsylvania law); *Fitzgerald v. Manning*, 679 F.2d 341 (4th Cir. 1982) (in community or similar one; applying Virginia law prior to July 1, 1976); *DeWitt v. Brown*, 669 F.2d 516 (8th Cir. 1982) (applying Arkansas law to hold physicians to standard of practice in same locality); *McBride v. United States*, 462 F.2d 72 (9th Cir. 1972) (required skill is that of similar communities); *Priest v. Lindig*, 583 P.2d 173 (Alaska 1978) (recognizing rule of standard of same specialty in similar communities); *Conrad v. St. Clair*, 100 Idaho 401, 599 P.2d 292 (1979) (duty is that of same locality); *Bartimus v. Paxton Community Hosp.*, 120 Ill. App. 3d 1060, 458 N.E.2d 1072 (1983) (same or similar community); *Weinstock v. Ott*, 444 N.E.2d 1227 (Ind. App. 1983) (skill of doctor's locality or same locality); *Karrigan v. Nazareth Convent & Academy, Inc.*, 212 Kan. 44, 510 P.2d 190 (1973) (skill of profession, community or similar community); *Tallbull v. Whitney*, 172 Mont. 326, 564 P.2d 162 (1977) (locality of similar geographical location, size and character in medical context); *Carrigan v. Roman Catholic Bishop*, 104 N.H. 173, 178 A.2d 502 (1962) (care and skill of ordinary practitioner in same or similar localities); *McPherson v. Ellis*, 305 N.C. 266, 287 S.E.2d 892 (1982) (standard of community or similar one); *Benzmiller v. Swanson*, 117 N.W.2d 281 (N.D. 1962) (similar locality in same general line of practice); *Getchell v. Mansfield*, 260 Or. 174, 489 P.2d 953 (1971) (same or similar locality); *Schenck v. Roger Williams Gen. Hosp.*, 119 R.I. 510, 382 A.2d 514 (1977) (skill of similar communities); *Bessinger v. DeLoach*, 230 S.C. 1, 94 S.E.2d 3 (1956) (same general neighborhood or similar communities); *Swan v. Lamb*, 584 P.2d 814 (Utah 1978) (same fields of comparable size in profession).

Two interesting variations on locality protection for general practitioners are *Chamness v. Odum*, 80 Ill. App. 3d 98, 399 N.E.2d 238 (1979), and *Gambill v. Stroud*, 258 Ark. 766, 531 S.W.2d 945 (1975). In *Chamness*, the court held that the term "locality" had no precise meaning and varied with the facts of the case; thus evidence of a standard of practice in some locality other than that of the physician need not automatically be excluded. For two cases that construed the term "community" to be the equivalent of a national medical community, see *infra* notes 63-66 and accompanying text.

The *Gambill* court's approach was similar to that taken in *Chamness*. Although the state adhered to the "same or similar" locality rule, there was nothing in the rule to prevent a plaintiff from establishing that the defendant physician should have referred the plaintiff to a larger medical center. *Gambill*, at 770B-770C, 531 S.W.2d at 950.

*Restatement of Torts.*⁴⁴

In many jurisdictions, the applicability of the locality rule to general practitioners is not clear. For example, courts in California differ in the application of the same locality or community standard.⁴⁵ One California court held that the general practitioner standard of care was a "contiguous community" standard,⁴⁶ while another court appeared to take a geographic approach, holding that the "community" included medical centers readily accessible regardless of similarity to the community of the defendant.⁴⁷ The applicability of the locality rule has created similar confusion in several other jurisdictions.⁴⁸

44. The RESTATEMENT (SECOND) OF TORTS § 299A (1965) states: "Unless he represents that he has greater or less skill or knowledge, one who undertakes to render services in the practice of a profession or trade is required to exercise the skill and knowledge normally possessed by members of that profession or trade in good standing in similar communities."

45. *Cobbs v. Grant*, 8 Cal. 3d 229, 502 P.2d 1, 104 Cal. Rptr. 505 (1972); *Meier v. Ross Gen. Hosp.*, 69 Cal. 2d 420, 445 P.2d 519, 71 Cal. Rptr. 903 (1968).

46. *Warnock v. Kraft*, 30 Cal. App. 2d 1, 3, 85 P.2d 505, 506 (1938).

47. *Gist v. French*, 136 Cal. App. 2d 247, 271, 288 P.2d 1003, 1018 (1955).

48. This has occurred in Colorado, *Murphy v. Dyer*, 409 F.2d 747 (10th Cir. 1969) (applying Colorado law to find a "similar community" rule); *Niblack v. United States*, 438 F. Supp. 383 (D. Colo. 1977) (applying Colorado law to find a "medical community" rule); *Stauffer v. Karabin*, 30 Colo. App. 357, 492 P.2d 862 (1971) (recognizing a "medical community" rule); *Foose v. Haymond*, 135 Colo. 275, 310 P.2d 722 (1957) (same neighborhood rule); and the District of Columbia, *Canterbury v. Spence*, 464 F.2d 772 (D.C. Cir.) (applying District of Columbia law, finding that similar locality rule governs but is inapplicable to failure of the physician to disclose risks of treatment), *cert. denied*, 409 U.S. 1064 (1972); *Smith v. Reitman*, 389 F.2d 303 (D.C. Cir. 1967) (applying District of Columbia law and finding similar locality rule governs); *Harris v. Cafritz Memorial Hosp.*, 364 A.2d 135 (D.C. 1976) (standard of reasonable care applied without reference to locality), *cert. denied*, 430 U.S. 968 (1977); *Staples v. Washington*, 125 A.2d 322 (D.C. 1956) (recognizing locality rule). Three cases applied District of Columbia law and recognized a locality protection for general practitioners. *See Rotan v. Greenbaum*, 273 F.2d 830 (D.C. Cir. 1959); *Furr v. Herzmark*, 206 F.2d 468 (D.C. Cir. 1953); *Hohenthal v. Smith*, 114 F.2d 494 (D.C. Cir. 1940). Confusion has also resulted in Florida, *Salinetto v. Nystrom*, 341 So. 2d 1059, 1061 (Fla. Dist. Ct. App. 1977) (same locality); *Brooks v. Serrano*, 209 So. 2d 279, 280 (Fla. Dist. Ct. App. 1955) (same or similar community rule applies to both specialists and general practitioners); *Montgomery v. Stary*, 84 So. 2d 34 (Fla. Dist. Ct. App. 1955) (locality not factor in establishing proximate cause); Missouri, *Silberstein v. Berwald*, 460 S.W.2d 707 (Mo. 1970) (locality not mentioned); *Williams v. Chamberlain*, 316 S.W.2d 505 (Mo. 1958) (locality is appropriate element of standard of care); *Sibert v. Boger*, 260 S.W.2d 569 (Mo. 1953) (same or similar locality); Nevada, *Lockart v. Maclean*, 77 Nev. 210, 361 P.2d 670 (1961) (although state followed strict locality rule, witness's familiarity with standards in same or similar locality may permit testimony), *rev'd on other grounds*, *Orcutt v. Miller*, 95 Nev. 408, 595 P.2d 1191 (1979); New York, *Hale v. State*, 53 A.D.2d 1025, 386 N.Y.S.2d 151 (N.Y. App. Div.) (locality not mentioned), *appeal denied*, 40 N.Y.2d 804, 356 N.E.2d 484, 387 N.Y.S.2d 1032 (1976); *Patterson v. Jewish Hosp. & Medical Center*, 94 Misc. 2d 680, 405 N.Y.S.2d 194 (N.Y. Sup. Ct.) (standard is that of "given community"), *aff'd*, 65 A.D.2d 553, 409 N.Y.S.2d 124 (N.Y. App. Div. 1978); *O'Neil v. State*, 66 Misc. 2d 936, 323 N.Y.S.2d 56 (N.Y. Ct. Cl. 1971) (same neighborhood); Ohio, *Bruni v. Tatsumi*, 46 Ohio St. 2d 127, 346 N.E.2d 673 (1976) (standard to be drawn from "medical community"); *Richardson v. Doe*, 176 Ohio St. 370, 199 N.E.2d 878 (1964) (same or similar locality); *Faulkner v. Pezeshki*, 44 Ohio App. 2d 186, 337 N.E.2d 158 (1975) (same or

B. Statutory Approaches to the Standard of Care

A number of states have resolved the standard of care problem by statute.⁴⁹ Several states codified the same or similar community rule.⁵⁰ However, even these statutes appear to leave room for imposing a national standard of care.⁵¹

The Delaware "wandering expert" statute appears to be the most restrictive of the various standard of care statutes.⁵² The statute requires, first, that the standard of care be established by expert testimony⁵³ and second, that the expert witness be familiar with the standards of the practitioner's community.⁵⁴ Courts interpret the statute as not limiting "community" to the borders of the state.⁵⁵ Virginia took a similar approach, enacting a statewide standard of care but reserving to the parties the right to prove that a local or similar locality standard is more appropriate.⁵⁶

Less restrictive standard of care requirements are exemplified by those statutes enacted in Alaska, Georgia, New Hampshire, Oklahoma, and, at one

similar locality not decided); Pennsylvania, *Ciccarone v. United States*, 350 F. Supp. 554 (E.D. Pa. 1972) (applying Pennsylvania law recognizing same locality rule), *aff'd*, 486 F.2d 253 (3d Cir. 1973); *Incollingo v. Ewing*, 444 Pa. 263, 282 A.2d 206 (1971) (similar locality rule recognized by supreme court, but court declined to clarify status of law at that time); *Smith v. Yohe*, 412 Pa. 94, 194 A.2d 167 (1963) (same or similar locality); *Freed v. Priore*, 247 Pa. Super. 418, 372 A.2d 895 (Pa. Super. Ct. 1977) (locality not mentioned); and Texas, *Webb v. Jorns*, 488 S.W.2d 407 (Tex. 1972) ("community" standard recognized; certain minimum standards exist regardless of community); *Caldwell v. Overton*, 554 S.W.2d 832 (Tex. Civ. App. 1977) (same locality); *Goodnight v. Phillips*, 458 S.W.2d 196 (Tex. Civ. App. 1970) (same or similar locality).

49. ALA. CODE § 6-5-484 (1977); ALASKA STAT. § 09.55.540 (1985); ARIZ. REV. STAT. ANN. § 12-563 (1982); ARK. STAT. ANN. § 34-2614 (Cum. Supp. 1985); DEL. CODE ANN. tit. 18, § 6853 (Cum. Supp. 1984); GA. CODE ANN. § 84-924 (Harrison 1985); IDAHO CODE §§ 6-1012, 6-1013 (1979); N.H. REV. STAT. ANN. § 508:13 (1983); N.C. GEN. STAT. § 90-21.12 (1985); OKLA. STAT. ANN. tit. 76, § 20.1 (West Supp. 1985); TENN. CODE ANN. § 29-26-115 (1980); VA. CODE ANN. § 8.01-581.20 (1984).

50. ALA. CODE § 6-5-484 (1977); ARIZ. REV. STAT. ANN. § 12-563 (1982); ARK. STAT. ANN. § 34-2614 (Cum. Supp. 1985); IDAHO CODE § 6-1012 (1979); N.C. GEN. STAT. § 90-21.12 (1985); TENN. CODE ANN. § 29-26-115(1) (1980).

51. The Alaska statute, for example, refers to the "knowledge or skill possessed . . . or exercised under the circumstances . . . by health care providers in the field or specialty in which the defendant is practicing." ALASKA STAT. § 09.55.540 (1985). There is nothing in this statute that, on its face, precludes establishing by expert testimony that a national standard exists for a given practice area or an applied medical technique.

52. DEL. CODE ANN. tit. 18, § 6854(a) (Cum. Supp. 1984) reads in pertinent part:

- No person shall be competent to give expert medical testimony as to applicable standards of skill and care unless such person is familiar with that degree of skill ordinarily employed in the community or locality where the alleged malpractice occurred, under similar circumstances, by members of the profession practiced by the health care provider; provided, however, that any such expert witness need not be licensed in the State.

53. *Id.* § 6853.

54. *Id.* § 6854(a). See *supra* note 52.

55. *Butler v. Alatur*, 419 A.2d 938 (Del. 1980); *Loftus v. Hayden*, 391 A.2d 749 (Del. 1978).

56. VA. CODE ANN. § 8.01-581.20 (1984).

time, Nevada. The Alaska statute holds "health care providers" to the same standard of care as other health care providers in the same field or specialty "under the circumstances."⁵⁷ Georgia's statute holds a physician to "a reasonable degree of care and skill," but it makes no mention of locality.⁵⁸ Nevada enacted a variation on the locality rule, repealed in 1985, which defined the physician's community as the entire area served by physicians among whom the patient could reasonably have chosen.⁵⁹ New Hampshire explicitly ruled out all considerations of area or locality as determinants of the standard of care.⁶⁰ The most liberal statute is that of Oklahoma, which enacted a national standard of care for all physicians.⁶¹

Even when a state enacts a restrictive standard of care, that standard of care can be judicially expanded. In two novel decisions, the Alabama Supreme Court expanded the legislature's statutory version of the general neighborhood rule⁶² to encompass a national standard. In *Zills v. Brown*,⁶³ a specialist malpractice case, the court held that the correct standard of care for the plaintiff to establish was a national one. It reached this conclusion by reading the codified general neighborhood rule as implying a "national medical neighborhood or national medical community" standard.⁶⁴ In broad dicta, the court did not limit the standard to medical specialists. Later, the same court in *Doctors Lane, Bryant, Eubanks & Dulaney v. Otts*⁶⁵ adopted the *Zills* dicta as its holding for all physicians. The court allowed for the demonstration of "justifiable circumstances" as a defense "for not adhering to the national standard of care [when] noncompliance with that standard is in issue."⁶⁶

II. THE DUTY TO KEEP ABREAST

One element of the standard of care for medical negligence is that a physician is required to keep reasonably abreast of medical progress.⁶⁷ The duty to keep abreast is historically related to and limited by the locality rule, which sheltered rural physicians from keeping abreast of developments in the field at large. The inability to keep abreast due to inadequacies in the dissemination of

57. ALASKA STAT. § 09.55.540(a)(1) (1985).

58. GA. CODE ANN. § 84-924 (Harrison 1985).

59. NEV. REV. STAT. § 630.013 (repealed 1985).

60. N.H. REV. STAT. ANN. § 508.13 (1983) reads in pertinent part: "In determining whether the person against whom a malpractice claim has been made has met the applicable standard of care, the jury or judge shall not be bound or limited by the standard of care accepted or established with respect to any particular geographical area or locality"

61. OKLA. STAT. ANN. tit. 76, § 20.1 (West. Supp. 1985).

62. ALA. CODE § 6-5-484 (1977).

63. 382 So.2d 528 (Ala. 1980) (per curiam).

64. *Id.* at 532 (emphasis in original).

65. 412 So.2d 254 (Ala. 1982).

66. *Id.* at 258 (emphasis in original).

67. *Reed v. Church*, 175 Va. 284, 293, 8 S.E.2d. 285, 288 (1940); R. MORRIS & A. MORITZ, DOCTOR, PATIENT AND THE LAW 331 (5th ed. 1971).

medical information was a major element of the physician's geographic protection from negligence. Additionally, keeping abreast with developments is restricted by the general requirement that physicians possess the same degree of knowledge and skill possessed by other physicians with whom they are compared.⁶⁸ Still, the duty to keep abreast has produced questions distinguishable from those that have surrounded the locality rule.⁶⁹ The demise of the strict locality rule increased the focus on the physician's duty to keep abreast. Without geographic insulation, new attention was devoted to the problem of what a physician should reasonably be held accountable to know.⁷⁰

It is clear that the duty to keep abreast extends only to medical information known or available at the time of treatment.⁷¹ In *Mallet v. Pirkey*,⁷² for example, a malpractice suit was brought against a physician for blindness resulting as a side-effect of treatment with a particular drug.⁷³ The court stated that the physician could not be held responsible as a matter of law for the drug's side-effects where "[t]he medical literature did not reveal *any* serious complications in its use."⁷⁴ An opposite result was reached in a similar case, *Reed v. Church*,⁷⁵ where a physician was held negligent in causing the blindness of a patient resulting from drug treatment.⁷⁶ The physician in *Reed*, unlike the physician in *Mallet*, had easy access to information that clearly warned against continued administration of the drug if vision problems arose.⁷⁷ *Mallet* and *Reed* define a spectrum in which physicians, regardless of whether there

68. R. MORRIS & A. MORITZ, *supra* note 67, at 331.

69. The holding in *Brune v. Belinkoff*, 354 Mass. 102, 109, 235 N.E.2d 793, 798 (1968), for example, expresses two distinct concepts: "The proper standard [of care] is whether the physician, if a general practitioner, has exercised the degree of care and skill of the average qualified practitioner, taking into account the advances of the profession." *Id.* at 109, 235 N.E.2d at 798. See Holder, *Failure to "Keep Up" as Negligence*, 224 J. A.M.A. 1461 (1973); Weintraub, *Physician's Duty to Stay Abreast of Current Medical Developments*, MED. TRIAL TECH. Q. 329 (1985).

70. *Darling v. Charleston Community Mem. Hosp.*, 50 Ill. App. 2d 253, 200 N.E.2d 149 (1964), *aff'd*, 33 Ill. 2d 326, 211 N.E.2d 253 (1965), *cert. denied*, 383 U.S. 946 (1966). The defendant physician had been treating a broken leg, which was eventually amputated due to complications. The physician, who settled out of court, admitted that he had not read a book on orthopedics for ten years. Similarly, the hospital made no efforts to require staff to keep current with medical developments. *Id.* at 294-95, 200 N.E.2d at 170. See also *Dayan v. Wood River Township Hosp.*, 18 Ill. App. 2d 263, 152 N.E.2d 205 (1958) (failure to keep abreast can result in medical doctor losing his or her hospital privileges).

71. *Tvedt v. Haugen*, 70 N.D. 338, 349, 294 N.W. 183, 188 (1940).

72. 171 Colo. 271, 466 P.2d 466 (1970).

73. *Id.* at 275, 466 P.2d at 468.

74. *Id.* at 280, 466 P.2d at 470 (emphasis in original). See also *Hodgson v. Bigelow*, 335 Pa. 497, 7 A.2d 338 (1939) (plaintiff established prima facie case of medical malpractice where defendant did not use well-recognized mode of treatment).

75. 175 Va. 284, 8 S.E.2d 285 (1940).

76. *Id.* at 289, 8 S.E.2d at 287.

77. *Id.* at 297, 8 S.E.2d at 290. The physician in *Reed* had in his possession pamphlets from the drug manufacturer warning of the possibility of blindness as a side-effect and describing the symptoms of its onset. *Id.*

is geographical protection in the standard of care, are held accountable to know information to which they reasonably had access.

*Burton v. Brooklyn Doctors Hospital*⁷⁸ raised the issue as to what degree a physician should be familiar with medical developments in order to be held accountable for knowledge that would affect his treatment decisions. In *Burton*, an individual blind since his premature birth⁷⁹ successfully sued for his injury. Physicians attending at his birth followed conventional medical wisdom by treating him with an oxygen-rich environment. The defendants, however, were conducting research at the time on the dangers of administering excess oxygen to premature babies, dangers including blindness.⁸⁰

Awareness of medical information affects treatment decisions and the standard of care in several ways. Although the development, criticism, and downfall of the strict locality rule involved many factors,⁸¹ courts still stressed the importance of access to current information. In *Brune v. Belinkoff*,⁸² one of the first decisions to directly overrule the strict locality rule,⁸³ the court emphasized the need for the physician to keep abreast of new developments.⁸⁴ Other courts examining the strict locality rule have also placed a premium on the currency of medical information. As early as 1916, the Minnesota Supreme Court, in suggesting that the Minnesota locality rule implied the entire state as a "locality," recognized that meetings, books, journals, and hospital experience "put the country doctor on more equal terms with his city brother."⁸⁵ These decisions stress that education and access to information are vital in assessing the standard of care.

III. THE IMPACT OF INFORMATION MANAGEMENT ON HEALTH SCIENCES

While society in general is experiencing a transition to an "information age," the growth in the importance of information and its management in the health sciences is better termed an "information explosion."⁸⁶ The role of

78. 88 A.D.2d 217, 452 N.Y.S.2d 875 (N.Y. App. Div. 1982).

79. *Id.* at 217, 452 N.Y.S.2d at 876.

80. *Id.* at 221, 452 N.Y.S.2d at 879.

81. *See supra* text accompanying notes 13-28.

82. 354 Mass. 102, 235 N.E.2d 793 (1968).

83. *See supra* text accompanying note 14.

84. *See supra* note 69.

85. *Viita v. Fleming*, 132 Minn. 128, 137, 155 N.W. 1077, 1081 (1916).

86. Hafner & Schwarz, *Medicine and Health Care: Implications for Health Sciences Library Practice*, 74 BULL. MED. LIBR. A. 142 (1986) noted that:

Revolutionary developments in biological and genetic research are changing the practice of medicine. The amount of new information generated is unprecedented. What makes this wave of information extraordinary is that it is occurring even while the technology that supports research is becoming more expensive and competition for public and private funds is growing. The new information shows no signs of slowing, and it will probably continue to grow. This information must be synthesized, stored, focused, and intelligently managed or the communication channels will be overwhelmed and its potential application lost.

Id.

professionals involved in health care has changed in response to the growing emphasis on access to current and accurate information. The unprecedented abundance of biomedical information has created a substantial need for better health information management procedures.

Medical information management did not emerge in this country as a specific discipline until the mid-nineteenth century.⁸⁷ Since 1836, with the creation of what would become the National Library of Medicine (NLM), the accumulation of and access to medical information has grown geometrically.⁸⁸ NLM's most fundamental and innovative change in health information management was the introduction of MEDLARS, the first large-scale, computer-assisted, biomedical information database. MEDLARS was developed to automate the indexing system necessary for the production of *Index Medicus*, a comprehensive topical index of significant medical literature.⁸⁹ A software system, ELHILL, was developed so that MEDLARS could be offered to the public in 1971 through various electronic information service vendors. The service

87. The effort to organize health information has a long history, beginning with the transition from an oral health information tradition to a written one. The first medical congress was held in 1681 in Rome. The growth of all literature following the invention of movable type influenced health sciences as well. Kilpatrick, *History of the Development of Medical Information*, 61 BULL. N.Y. ACAD. MED. 230, 231-34 (1985).

88. In 1836, the United States Army established a small library to support the work of military physicians. Kunz, *Index Medicus: A Century of Medical Citation*, 241 J. A.M.A. 387, 387 (1979). John Shaw Billings, an army surgeon, was appointed to oversee this library. Billings systematized health sciences information management by instituting indexing and other modern techniques. R. SHRYOCK, *THE DEVELOPMENT OF MODERN MEDICINE* 182-83 (1936). The Library of the Surgeon General of the United States Army, under Billings' administration would, by 1873, be the largest medical library in the United States, containing over 50,000 volumes. W. MILES, *A HISTORY OF THE NATIONAL LIBRARY OF MEDICINE* 86 (1982).

In 1956, Congress designated the Billings' library as the National Library of Medicine (NLM). S. 3430, 84th Cong., 2d Sess., reprinted in 1956 U.S. CODE CONG. & ADMIN. NEWS 1134. The purpose of the library was to "aid in the dissemination and exchange" of scientific and medical information. H.R. REP. No. 941, 84th Cong., 2d Sess., reprinted in 1956 U.S. CODE CONG. & ADMIN. NEWS 4245. The National Library of Medicine Act, P.L. 84-941, was intended to provide firm statutory support for the Library in order to ease problems of administration and budgeting. *Id.* A series of bills followed over the years, beginning in 1965 with the Medical Library Assistance Act, which allowed NLM to expand its services and increase its impact upon the management of health information. P.L. 89-291, 79 Stat. 1059 (1965). The Medical Library Assistance Act authorized and promoted NLM administration of activities to improve the information sharing and delivery capabilities of all United States medical libraries through organization of resource sharing procedures. Throughout the legislative history of the Medical Library Assistance Act there is a consistent theme of equalizing the national access to medical information. H.R. REP. No. 1026, 89th Cong., 1st Sess., reprinted in 1965 U.S. CODE CONG. & ADMIN. NEWS 3783, stated that the purpose of the Regional Medical Libraries, established under the administration and guidance of the NLM, is "[t]o improve the access to [medical information] in terms of speed and ease and thereby insure the widest dissemination of research results and their applications to health practice [and] to serve the needs of any geographical area where no health science library exists which is suitable as a base for development as a regional library." *Id.* at 3791-92.

89. Schoolman, *The Impact of Electronic Computers and Other Technologies on Information Resources for the Physician*, 61 BULL. N.Y. ACAD. MED. 283, 284 (1985).

then became known as MEDLINE (MEDLARS On-Line).⁹⁰ Today, more than 5,000,000 medical journal citations are available through NLM's MEDLINE database. More than 2,000,000 MEDLINE searches are performed annually both by personal computer and through computers in 2,500 public and private institutions, agencies, corporations, universities, and other organizations throughout the world.⁹¹

A by-product of the explosion of medical information available through electronic means is the use of information intermediaries. Medical librarians, trained in the specialized field of medical database searching, are bibliographers and information "gatekeepers," who perform computer-assisted literature searches and arrange and order information on behalf of physicians.⁹² Librarians trained in searching procedures perform numerous searches, thereby freeing the physician for diagnostic and treatment work. Medical librarians research specific physician inquiries to generate tailored bibliographies of

90. Early MEDLINE search requests often took between three and six weeks to process. See W. MILES, *supra* note 88, at 9. Clients mailed search requests to NLM on specially designed forms. Subject specialists then translated the requests into machine readable forms and input the proper commands to the computer. Since it took almost fifty minutes to process one subject search, the searches were held and processed in batches. The retrieval was reviewed by the specialist for accuracy, then returned to the client. The service was limited because only a few operators were sufficiently familiar with the system to process search requests. *Id.* at 378. Over 1,600 searches were performed this way; by 1966 over 3,000 searches were performed annually. *Id.* at 380. Decentralization of the system began in 1965 when it was recognized that NLM subject specialists were becoming overwhelmed by requests for computer searches. Contracts to obtain NLM tapes and to train librarians in search skills were established at universities throughout the United States and in some foreign countries. MEDLINE, the library's on-line retrieval service, became available nationwide in 1971. Using this system, clients could easily obtain a list of citations in a few minutes. The current wave of user-friendly systems, with few protocols and menu driven screens, makes it possible for non-computer experts to access the MEDLARS system. See *infra* text accompanying notes 95-102. See Hubbard, *An Integrated Information Management Education Program*, 10 ONLINE 15 (1986). In the early days of MEDLINE, use of the system was restricted not only by expertise, but by stringent password requirements as well. It was not uncommon for one password to be assigned to an institution, or for entire institutions to time-share passwords. Today, MEDLINE access is still controlled by password, but passwords are available to any individual. With the decline in the cost of computers and computer software, it has become possible for anyone to have access to the system in their office or home.

91. Collen & Flagle, *Full-Text Medical Literature Retrieval by Computer*, 254 J. A.M.A., 2768, 2768-69 (1985).

92. The medical community turned to trained librarians for several reasons. Among these are that traditional library searches took too long, that extraneous information was being obtained in the searches and that it was seen as an unacceptable distribution of manpower. The Medical Library Association developed programs in the 1960's to provide training for librarians in this specialized field. Formal clinical medical librarian programs began in 1971 at the University of Missouri-Kansas City, under a grant from the National Library of Medicine. This program's purpose was to train librarians to accompany physicians on their rounds and return to the library to search for patient care information. These librarians were a link between inpatient service and the on-line computer services. See Cimpl, *Clinical Medical Librarianship: A Review of the Literature*, 73 BULL. MED. LIBR. A. 22 (1985).

relevant articles using controlled vocabularies and procedures to access MEDLINE and other commercially available medical databases.⁹³

The advent of computer-assisted medical literature searching has given physicians timely access to virtually all significant information necessary for patient diagnosis and treatment. Given a skilled intermediary, access to relevant information is greatly facilitated. The geographical barriers that were instrumental in bringing about the locality rule are transcended where information access is concerned.⁹⁴

MEDLINE and other biomedical databases have been available for some time. Yet physicians have not made extensive personal use of computer searching. Until recently, accessing biomedical databases required that rigid protocols be followed with the use of controlled vocabularies. Physicians have generally lacked the time necessary to become proficient in the procedures required for on-line searching. However, software systems, such as PaperChase⁹⁵ and GRATEFUL MED,⁹⁶ allow searchers access to NLM materials

93. In discussing the role of the National Library of Medicine in the development of major information projects, Irwin H. Pizer, University Librarian for the Health Sciences and Professor of Library Automation at the University of Illinois at Chicago, wrote: "[Database users] had a very low tolerance for a system which required them to proceed through a lengthy series of questions and answers in order to formulate their search . . . Users preferred to have a trained intermediary perform their searches, especially as few users searched the system with enough frequency to become highly proficient, and most were not able to keep up with system changes which altered searching formulations." Pizer, *Looking Backward, 1984-1959: Twenty-Five Years of Library Automation—A Personal View*, 72 BULL. MED. LIBR. A. 344 (1984).

94. An example of the efficacy of on-line searching in medical treatment is found in the case of a teenage-boy with a numb chin. Prior to examining the patient, an Atlanta internist personally performed a thirty-second MEDLINE search. His literature search revealed a single reference. According to the journal article he found, nine of nineteen patients who reported numbness on both sides of their chins as their only symptom were later diagnosed as having malignant tumors. A CAT scan revealed that the boy had a "rapidly proliferating mass—a lymphoma" behind the eye—an area where tumors cannot be detected with routine exams. Aggressive chemotherapy was commenced forty-eight hours later. See Mitric, *Spreading the Medical Word*, Wash. Post, Apr. 9, 1986, at Z10. Physicians who perform online searches have the additional support of bibliographic utilities such as OCLC, RLIN, and SERLINE to facilitate delivery of documents over geographical boundaries. Through interlibrary loan subsystems, library patrons have access to, and can electronically request, copies of more than thirteen million foreign and domestic monographs, journals and serials. More than 2800 academic, public, corporate, research, college and university, and medical libraries participate in these library systems; 318 of these are medical and hospital libraries. As a result, there is a substantial corpus of medical literature accessible directly through these systems. Document delivery is efficient, and electronically requested materials can be rapidly obtained. The seven Regional Medical Libraries established by the NLM provide rapid access to virtually any medical document that cannot be secured through other channels. The distribution of the Regional Libraries in Baltimore, Chicago, Dallas, Los Angeles, New York, Omaha, and Seattle is intended to equalize national access to medical literature. See *supra* note 88.

95. Horowitz, Jackson & Bleich, *PaperChase: Self-Service Bibliographic Retrieval*, 250 J. A.M.A. 2494 (1983).

96. *GRATEFUL MED: A New Way to Search MEDLINE*, 41 NAT'L LIBR. MED. NEWS 2, 4 (1986).

through a much simpler command system that uses natural language. Both PaperChase and GRATEFUL MED require a minimum of training and can be used through a personal computer. Either system makes it easier for professionals to conduct on-line searching and bypass specially trained intermediaries.

The most significant recent innovation in medical information delivery systems is MEDIS. MEDIS is offered by Mead Data systems, the vendor that provides the legal community with LEXIS and the general information database, NEXIS. MEDIS combines the user-friendly elements of PaperChase or GRATEFUL MED searching with a full-text retrieval capability. Now physicians and other users of MEDIS can apply a user-friendly system to access the full text of stored documents, as attorneys are able to do with LEXIS. This innovation in information management eliminates one of the deficiencies of MEDLINE and other medical databases that provide access only to citations or abstracts of articles. A searcher accessing MEDLINE does so using key words and medical terminology, generating a bibliography of relevant citations or abstracts, many of which may prove to be irrelevant. MEDIS, however, allows the searcher to both develop the bibliography and access on-screen the entire text of the desired source, in theory, improving search efficiency.⁹⁷

Only recently has the MEDIS system become commercially available.⁹⁸ MEDIS searchers' full-text access is limited to those journal volumes stored in the MEDIS database. Presently, MEDIS can access the full-text of approximately 50 journals, plus some textbooks and federal publications. MEDIS searchers, however, can also apply the system's user-friendly techniques to access the voluminous information stored in MEDLINE, though only in citation or abstract form.⁹⁹

For all its potential, the introduction of automated health information management has not yet had a profound effect upon the way medicine is practiced or taught in this country, other than to make relevant information more efficiently available to the physician. One commentator stated that medical educators "appear to be remarkably deficient in their understanding of the language and concepts" of medical information management through technology.¹⁰⁰ This commentator attributes the lack of momentum in part to the absence of a "universally accepted system."¹⁰¹ However, it is just as likely that learning the difficult search procedures and protocols of most available information delivery systems has been an equal impediment. The contents and services of MEDIS will certainly be expanded. No doubt MEDIS will promote

97. Hafner, *MEDIS: A Philosophical Breakthrough in Medical Information Management*, 147 ARCHIVES INTERNAL MED. 417 (1986).

98. Collen & Flagle, *supra* note 91.

99. MEDLINE stores only citations and abstracts (when available), not the full-text of the indexed documents. Hafner, *supra* note 97.

100. Schoolman, *supra* note 89, at 288.

101. *Id.*

competition in the field of user-friendly, full-text biomedical information searching. It is very possible that MEDIS will be the impetus to make computer-assisted searching as common for medical students and physicians as the use of LEXIS and WESTLAW has become for law students and attorneys.¹⁰²

IV. LEGAL IMPACT OF THE COMPUTER ON MALPRACTICE

Computer-assisted literature search services, such as MEDIS, PaperChase, and GRATEFUL MED will be partially responsible for significant changes in how medical liability is determined. This will not be the first time that medicine has been so affected by new technologies. Advances in medical science have created legal and ethical issues beyond malpractice, such as brain death,¹⁰³ withdrawal of involuntary feeding,¹⁰⁴ reproductive technology,¹⁰⁵ and genetic screening in the workplace.¹⁰⁶

Changes in the law precipitated by developments in electronics and telecommunications are not novel. Both the criminal and the civil law are undergoing significant revision in response to the impact of electronic information technology upon society.¹⁰⁷ The law, as it affects the practice of medicine, has

102. An extensive study of the effectiveness of computer-assisted full-text legal research can be found in Dabney, *The Curse of Thamus: An Analysis of Full-Text Legal Document Retrieval*, 78 LAW LIBR. J. 5 (1986). The author suggests that full-text searching using keywords in a caselaw database can be improved by adding subject-oriented indexing in order to reduce the retrieval of many irrelevant cases. *Id.* at 39.

103. See Comment, *Can Good Medicine be Bad Law? In re Haymer*, 61 CHI.-[KENT L. REV. 151 (1985); Gaylin, *Harvesting the Dead*, 249 HARPER'S 23 (1974).

104. See, e.g., Lynn & Childress, *Must Patients Always Be Given Food and Water?*, 13 HASTINGS CENTER REP. 17 (1983); Bernstein, *A patient's right to die by starvation*, 58 HOSPITALS 75 (1984).

105. See Andrews, *The Stork Market: The Law of the New Reproduction Technologies*, 70 A.B.A. J. 50 (1984); Henahan, *Medical News: Fertilization, embryo transfer procedures raise many questions*, 252 J. A.M.A. 877 (1984); *Artificial reproduction faces legal issues*, Am. Med. News, Aug. 24/31, 1984, at 3, col. 1.

106. See Goerth, *Genetic Screening and the law: Question Waiting for an Answer*, OCCUPATIONAL HEALTH & SAFETY, Apr. 1983, at 49; Murray, *Thinking the Unthinkable About Genetic Screening*, 20 ACROSS THE BOARD 34 (1983); Miller, *Biological Monitoring: The Employer's Dilemma*, 9 AM. J.L. & MED. 387 (1983); West, *Genetic Testing on the Job*, 3 SCIENCE '82 16 (1982).

107. See, e.g., *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240 (3d Cir. 1983) (computer programs and copyright infringement); *White Consol. Indus. v. Vega Servo-Control, Inc.*, 713 F.2d 788 (Fed. Cir. 1983) (computer programs held as trade secrets); *United States v. Girard*, 601 F.2d 69 (2d Cir.) (definition of "things of value": in anti-theft statute, 18 U.S.C. § 641 (1982), broadened to include government computerized records), *cert. denied*, 444 U.S. 871 (1979); *United States v. Curtis*, 537 F.2d 1091 (10th Cir. 1976) (mail fraud through computerized dating scheme); *Paine, Webber, Jackson, & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, Inc.*, 564 F. Supp. 1358 (D. Del. 1983) (methods of doing business implemented on computer held patentable); *New York v. Weg*, 113 Misc. 2d 1017, 450 N.Y.S.2d 957 (N.Y. Crim. Ct. 1982) (no felonious intent in use of computer by authorized employee for unauthorized purposes); Freed, *Security Interests in the Computer Age: Practical Advice for the Secured Lenders*, 101 BANKING L.J. 404 (1984); Graham, *Fair Administration of the Freedom of Information Act*

already been altered by the computer. The computer's potential for storing and sorting data led one commentator to speculate on implications for the privacy rights of individuals in their medical records where such records were to be used in evaluating competition among medical facilities and health providers pursuant to federal law.¹⁰⁸ The accuracy of computerized blood and urine tests and patient monitoring devices depends upon the quality of the programs that control their functions. In the foreseeable future, a patient suit could arise for injuries caused by defective computer programming. Such a suit could be based in strict or products liability rather than negligence.¹⁰⁹

The physician's duty to keep abreast will be revised as information management technology continues to affect information distribution and access. As new research becomes available more quickly, physicians will have increased opportunities to evaluate their treatment and diagnosis decisions against a broader background of supporting and conflicting information. The importance of current medical journal information was shown in *Mahr v. G.D. Searle & Co.*¹¹⁰ In *Mahr*, medical journal articles that discussed possible side-effects of the defendant's oral contraceptive were held to be adequate notice of a product defect to the manufacturer. The court held that the defendant was liable for the consumer's injuries because he failed to give adequate warning of side effects.¹¹¹ *Mahr* was a case of strict products liability rather

after the Computer Revolution, 5 COMPUTER L.J. 51 (1984); Special Project, *White-Collar Crime: Third Annual Survey of Law*, 22 AM. CRIM. REV. 279, 494 (1985); Note, *Computer Abuse: The Emerging Crime and the Need for Legislation*, 12 FORDHAM URB. L.J. 73 (1984); Comment, *Computer Malpractice: Are Computer Manufacturers, Service Bureaus, and Programmers Really the Professionals They Claim to Be?*, 23 SANTA CLARA L. REV. 1065 (1983) [hereinafter Comment, *Computer Malpractice*].

108. Watson, *Disclosure of Computerized Health Care Information: Provider Privacy Rights Under Supply Side Competition*, 7 AM. J.L. & MED. 265 (1981).

109. See Brannigan & Dayhoff, *Liability for Personal Injuries Caused by Defective Medical Computer Programs*, 7 AM. J.L. & MED. 123, 137 (1981) (such a case requires choice between encouragement of technological development and individual's welfare). See also Dreisonstok v. Volkswagenwerk, A.G., 489 F.2d 1066, 1074 (4th Cir. 1974) (court held that minibus design that provided no protection to driver in collision was not defective as matter of law because design feature made bus desirable to consumers).

For information on computer applications in clinical medical practice, including computer software as a medical device, see Gardner, *Computerized Management of Intensive Care Patients*, 3 M.D. COMPUTING 36 (1986) (computer assisted patient monitoring); Pollak, *The Computer in Medicine: Its Application to Medical Practice, Quality Control, and Cost Containment*, 253 J. A.M.A. 62 (1985) (case study of applicability of computer to individualized care of nephrology patients); Sanders & Harrison, *A Consumer's Guide to Computerized Arrhythmia Monitoring*, 248 J. A.M.A. 1745 (1982) (computers used to monitor heart irregularities in cardiac patients). For a discussion of programming and services liability based on negligence rather than products liability, see Comment, *Computer Malpractice*, *supra* note 107.

110. 72 Ill. App. 3d 540, 390 N.E.2d 1214 (1979).

111. *Id.* at 562, 390 N.E.2d at 1230. *Mahr* was a classic "battle of experts" in which the plaintiff successfully sued for the wrongful death of his wife due to a stroke. The stroke was caused by blood clotting resulting from her use of the defendant's oral contraceptive. The appellate

than negligence. Nevertheless, the applicability to medical malpractice cases of the *Mahr* concept of notice should be considered.

As physicians' access to information is improved by the computer, the line between negligence and strict liability in medicine continues to blur.¹¹² Improved access to information may also broaden the physician's duty of informed consent.¹¹³ It is possible that physicians will have a higher duty to search out and report side-effects and alternative treatments so that a patient's decision will be an informed one, considering the efficiency with which a literature search can be conducted.

Universal access to electronically-stored biomedical information could remove the last remnants of the locality rule from the standard of care in medical negligence suits. There seems to be little practical reason, if other factors remain unchanged, to maintain less than a national standard of care for any practitioner where information is concerned. Logistical barriers, such as the proximity to physical resources, will remain a valid aspect of the standard of care. However, reliance upon an "information-based" standard risks exposure to judicial activism such as that demonstrated by the Alabama judiciary in its reformulation of the community standard to a national one.¹¹⁴

Courts have recognized the effect of "modern communications" upon the standard of care, but they have not yet found it necessary to analyze the pervasive impact that information technology will have on the practice of medicine. As medical practice becomes more information-intensive, physicians will increasingly rely on computer-assisted management of biomedical information. Greater integration of human and mechanical health care resources

court affirmed the trial court's careful control of the use of medical journal articles to impeach a defense expert. The trial court allowed the plaintiff to introduce only those studies published prior to the wife's death. *Id.* at 573, 390 N.E.2d at 1236.

112. See *Helling v. Carey*, 83 Wash. 2d 514, 520, 519 P.2d 981, 984 (1974) (Utter, Assoc. J., concurring). See Ackerman, *Medical Malpractice: A Time for More Talk and Less Rhetoric*, 37 MERCER L. REV. 725, 732 (1986), in which the author states that "a deliberate change in legal rules under which doctors would be held liable for . . . injuries caused by medical treatment without regard to fault . . . might represent an improvement over the present system, under which juries *improperly* find [malpractice] liability." *Id.* at 732 (emphasis in original). Ackerman points out, however, that such a system presents several serious problems: prohibitive insurance expenses, problems of proof, and a potentially objectionable use of physicians to achieve loss-spreading. *Id.* at 733. See Epstein, *Medical Malpractice: The Case for Contract*, 1976 AM. B. FOUND. RES. J. 87.

113. The decision in *Harnish v. Children's Hosp. Medical Center*, 387 Mass. 152, 439 N.E.2d 240 (1982), states that a doctor must "disclose in a reasonable manner all significant medical information that the physician possesses or reasonably should possess that is material to an intelligent decision by the patient whether to undergo a proposed procedure." *Id.* at 155, 439 N.E.2d at 243. See W. PROSSER, *supra* note 10, § 32, at 190: "Surgeons and other doctors are . . . required to provide their patients with sufficient information to permit the patient himself to make an informed and intelligent decision on whether to submit to a proposed course of treatment or surgical procedure." See *Computers extend a doctor's scope—and his liability*, 23 MEDICAL WORLD NEWS 121 (1982).

114. See *supra* text accompanying notes 62-66.

is unavoidable.¹¹⁵ To date, relatively little attention has been devoted to understanding the role of electronics in medical malpractice. This will soon change by necessity.¹¹⁶

The effect of computer-assisted research on the standard of care for specialists needs to be examined. In a majority of states, specialists are already held to a higher standard of care than general practitioners.¹¹⁷ Recently, the Washington Supreme Court demonstrated in a series of standard of care cases that even a national standard can be enhanced. In *Helling v. Carey*,¹¹⁸ the court considered the professional liability of an ophthalmologist, who, it was alleged, failed to properly treat the plaintiff for glaucoma.¹¹⁹ The plaintiff visited the ophthalmologist, complaining of symptoms that indicated glaucoma. The physician, however, did not administer a simple, painless, and inexpensive

115. A frequently cited blueprint for adapting traditional and electronic means of managing biomedical information is contained in N. MATHESON & J. COOPER, *ACADEMIC INFORMATION IN THE ACADEMIC HEALTH SCIENCES CENTER: ROLES FOR THE LIBRARY IN INFORMATION MANAGEMENT* (1982). This significant work recognizes the needs and opportunities for establishing a fully-integrated system of information management in health institutions. The authors advocate an expanded role for information management professionals and development of state-of-the-art technologies in anticipation of a coming crisis in biomedical information management.

116. The law must strike the proper balance between the theoretically universal availability of electronic information management and its practical limitations. See *Rogers v. Okin*, 478 F. Supp. 1342 (D. Mass. 1979). Noted for its analysis of the use of anti-psychotic drugs on mental patients without their consent, *Rogers* presents an interesting malpractice issue as well. In a multi-count class action challenging treatment procedures at Boston State Hospital, a public institution for the mentally ill, the district court held it was appropriate, in weighing the malpractice portion of the claim, "to consider the medical resources and support facilities available to the defendants at the Boston State Hospital." *Id.* at 1384 (citation omitted). The court stated that salaries at the hospital "were not competitive with private institutions," and therefore, "the Commonwealth found it difficult to attract and retain competent and experienced staff." *Id.* Generally, defendant physicians who had "little control over the quality or quantity of staff or physical resources . . . were required to work with what they had." *Id.* at 1385. Therefore, the defendant physicians were not held responsible for the differences between the treatment resources of state and private hospitals.

Such reasoning would probably provide temporary protection to physicians and hospitals not able to afford electronic data access and management systems. However, most diagnostic and treatment equipment considered basic today was once considered "experimental" or "too expensive" to be required. Given the explosive and continued growth of information technology, it is only a matter of time until computer-assisted access to all types of data is commonplace. The standard for determining when the benefits of new technology outweigh the costs can be found in Judge Learned Hand's landmark opinion in *The T. J. Hooper*, 60 F.2d 737 (2d Cir.), cert. denied, 287 U.S. 662 (1932), in which a tugboat owner was held negligent for failing to install a radio transmitter that would have informed the captain of an approaching storm that caused the loss of barges under tow. Judge Hand made this decision despite the fact that there was no industry custom to use radio equipment at that time. See *Watson, Liability for Failure to Acquire or Use Computers in Medicine*, PROCEEDINGS: THE FIFTH ANNUAL SYMPOSIUM ON COMPUTER APPLICATIONS IN MEDICAL CARE (1981).

117. See *supra* text accompanying notes 31-42.

118. 83 Wash. 2d 514, 519 P.2d 981 (1974).

119. *Id.* at 516, 519 P.2d at 982.

glaucoma test because of the extreme rarity of glaucoma in patients of the plaintiff's age group.¹²⁰ The physician argued that his decision was consistent with the standards of the profession.¹²¹ The court found the physician negligent, holding that even though the specialist standard weighed against administration of a glaucoma test, it was reasonable for the physician to apply the test, considering its simplicity and the patient's symptoms.¹²² According to the court, "no judgment factor [was] involved." If the patient's symptoms indicated the need for the test, the question was not what "ought" to be done considering the professional standard, but what was "reasonably prudent" for the physician to do.¹²³ The concurring opinion defined the court's decision as an imposition of a duty higher than the professional duty in these narrow circumstances.¹²⁴

The state of Washington enacted a statutory standard of care that appeared to negate the *Helling* court's superimposition of "reasonable prudence" upon the professional standard of care.¹²⁵ In a later case, however, the court held that the "reasonable prudence" test of *Helling* survived the new statute and that negligence was to be evaluated in light of all relevant circumstances.¹²⁶ Complying with the national standard for specialists can therefore be inadequate if dutiful adherence to the professional standard is not reasonable.¹²⁷

The implications of the *Helling* reasoning combined with the potential impact of electronic biomedical information management are profound. Currently, computer-assisted literature searching is but one of many diagnostic and treatment tools. Although computer connect time is costly,¹²⁸ various forms

120. In the under-40 age group, the incidence of glaucoma is one or less in every 25,000 people. *Id.* at 518, 519 P.2d at 983.

121. *Id.* at 517, 519 P.2d at 982.

122. *Id.* at 518, 519 P.2d at 983.

123. *Id.*

124. *Id.* at 520, 519 P.2d at 984 (Utter, Assoc. J., concurring).

125. WASH. REV. CODE § 4.24.290 (1974), provides that a plaintiff in a malpractice action must prove by a preponderance of the evidence that the physician "failed to exercise that degree of skill, care, and learning possessed at that time by other persons in the same profession" There is no mention of "reasonable prudence" in the statute. This standard of care was reiterated by the legislature in WASH. REV. CODE § 7.70.040 (1974).

126. *Gates v. Jensen*, 92 Wash. 2d 246, 247, 595 P.2d 919, 924 (1979). See *Harris v. Groth*, 99 Wash. 2d 438, 451, 663 P.2d 113, 120 (1983), which states that "[t]he degree of care actually practiced by members of the profession is only some evidence of what is reasonably prudent—it is not dispositive." *Id.* at 451, 663 P.2d at 120.

127. The latest formulation of the *Helling* test is *Brown v. Dahl*, 41 Wash. App. 565, 705 P.2d 781 (1985), in which the court discusses the "reasonable prudence" of the physician under the circumstances. See also *Harbeson v. Parke-Davis*, 98 Wash. 2d 460, 483, 656 P.2d 483, 497 (1983) (standard is that of general practitioner); *Keogan v. Holy Family Hosp.*, 95 Wash. 2d 306, 327-28, 622 P.2d 1246, 1258-59 (1980) (degree of skill possessed by medical profession).

128. Cost, however, is a relative concept. Matheson and Cooper noted, "A unique opportunity exists today to combine the strong position in biomedical research and communications technologies [to] reshape the biomedical information environment Modest financial investments [are required] in relation to the national benefits that can accrue." N. MATHESON & J. COOPER, *supra*

of automated biomedical information management will likely become more common as information centers respond to a multitude of serious problems. Library collections of published information are being affected by many factors: materials published on acid-content paper in this century are rapidly deteriorating; publication costs are rising at a rate significantly higher than the inflation rate, making acquisitions more costly; and budgetary cutbacks have resulted in tighter limits on library space and staff size.¹²⁹

The consensus among library and information management professionals appears to be that automation is the most cost-effective solution to many biomedical information management problems.¹³⁰ Electronic biomedical information management has many advantages as a response to practical problems. These advantages, combined with the very likely probability that information technology will continue to improve, will in time overcome cost obstacles. Electronic storage, management, and transmission of biomedical information could then become the rule rather than the exception,¹³¹ even in light of the real limitations of automated retrieval systems.¹³²

As courts begin to encounter questions about the standard of care, informed consent, and other aspects of malpractice affected by electronic information management, new issues will emerge. For example, the failure of a specialist to conduct or request a computer-assisted literature search, if the need for one is indicated, might be considered "not reasonably prudent."¹³³ Other courts may follow *Zills* and expand statutory "neighborhood" standards to encompass a medical community nationalized by information sharing. Courts must define "reasonable" research where a treatment decision or diagnosis could have been influenced by review of the professional literature, facilitated by computer-assisted literature searching. As physicians are increasingly forced to practice "defensive medicine," or treatments and tests performed to prevent a future negligence claim,¹³⁴ the costs of "defensive research" may be added to this burden.

note 115, at 104. See also *Rogers v. Okin*, 478 F. Supp. 1342, 1384-85 (D. Mass. 1979) (court held it unjust to hold medical personnel individually responsible for resource deficiencies).

129. Friedman, *The Future of Medical Information and Medical Libraries*, 61 BULL. N.Y. ACAD. MED. 290 (1985).

130. See N. MATHESON & J. COOPER, *supra* note 115. But see Brodman, *The Physician as Consumer of Medical Literature*, 61 BULL. N.Y. ACAD. MED. 266 (1985) (author argues that impact of new information technologies on practice of medicine will be slight).

131. Publishers might begin to distribute significant amounts of information to the consumer electronically. See, e.g., Crawford, *From Hard Copy to Electronic Publishing: Problems in Accessing the Literature*, 241 J. A.M.A. 399 (1979); Lock, *Future Journals; paper or computers?*, 285 BRIT. MED. J. 114 (1982).

132. See Dabney, *supra* note 102; Doszkocs, Rapp & Schoolman, *Automated Information Retrieval in Science and Technology*, 208 SCIENCE 25, 28 (1980).

133. See *Harbeson v. Parke-Davis, Inc.*, 98 Wash. 2d 460, 656 P.2d 483 (1983) (failure of treating physicians to perform literature search was significant factor in Washington Supreme Court's finding of negligence in its landmark wrongful birth/wrongful life decision).

134. See Hafner & Schwarz, *supra* note 86, at 143; AMERICAN MEDICAL ASS'N SPECIAL TASK

Information-based liability is a question of special significance in medicine for several reasons. The American medical profession currently appears to be at the crest of a national tort reform movement, both as a proponent of reform and as an apparent victim of past liability excess.¹³⁵ Additionally, medical professionals rely heavily on access to the most current and relevant information in their practices. Finally, the phenomenal growth in the amount of available information has created unprecedented pressures to find better ways to manage the information and to conserve physicians' time.¹³⁶ Given the current trends, the law will probably be faced with considering two important policy questions regarding information-based liability.

First, courts must consider whether it is appropriate for policy reasons to allow physician malpractice liability to be so affected by information technology. Physicians are exposed to "information overload" as soon as they enter medical school.¹³⁷ A study performed in England showed that medical students in the basic science curriculum were required to learn 47,900 different facts and 29,900 concepts, indexed in textbooks by 19,800 unique terms, or an average of twenty-four new facts or concepts during every hour of the first two years of study.¹³⁸ Automated information retrieval and management may simply provide too much information. Faced with a universe of possibilities, it is difficult to decide whether any particular choice made by a physician can be reasonable or unreasonable. A physician's "mere reading of medical journals alone cannot give the reader [actual] knowledge" of procedures, techniques, or a standard of care.¹³⁹ Information-based theories of liability therefore

FORCE ON PROFESSIONAL LIABILITY AND INSURANCE (1984-85), *Report I*, in PROFESSIONAL LIABILITY IN THE '80s, REPORTS 1, 2 & 3, at 3 (1984).

135. Many coalitions have been formed to advocate tort reform at both the state and federal levels. One such coalition, the American Tort Reform Association, includes such members as the American Medical Association, the American Association of Junior Colleges, the American Business Conference, the American Consulting Engineers Conference, the American Institute of Architects, the National Federation of Independent Businesses, and some 200 other such organizations. Tort reform has been declared to be the top priority of the Chamber of Commerce of the United States. The problem is just as severe for municipalities, now frequently becoming the "deep pocket" in cases of joint and several liability where a private party defendant is uninsured. See *Seeking Justice: People Prone to Sue Have Many Reasons, And Money Is But One*, Wall St. J., May 20, 1986, at 1, col. 1; *MDs no longer alone in tort reform fight*, Am. Med. News, February 14, 1986, at 1, col. 1. The liability crisis is most acute in the health professions. Currently, four congressional bills are pending, designed to ease the medical liability crisis: S. 1804, 99th Cong., 1st Sess. (1985) (Hatch & Inouye); H.R. 3865, 99th Cong., 1st Sess. (1985) (Lent *et al*); H.R. 2659, 99th Cong., 1st Sess. (1985) (Mrazek); and H.R. 3084, 99th Cong., 1st Sess. (1985) (Moore-Gephardt).

136. See Doszkocs, Rapp & Schoolman, *supra* note 132, at 30; Hafner & Schwarz, *supra* note 86; N. MATHESON & J. COOPER, *supra* note 115, at 10.

137. Anderson & Graham, *A problem in medical education: is there an information overload?*, 14 MED. EDUC. 4 (1980).

138. *Id.* at 6-7. Anderson and Graham suggest that information pressures contribute to an inordinately high suicide rate among medical students. *Id.* at 5.

139. Harlan, *A Statewide Standard of Care in Medical Malpractice cases—We're Shoveling Smoke*, 18 U. RICH. L. REV. 361, 372 (1984).

can be viewed as an inappropriate equation of awareness with knowledge. Alternatively, the increased awareness burden may be an acceptable cost of improving professional standards through better information processing.

The second policy question that courts will have to address if information-based liability arises in medical negligence cases is whether a similar liability should be extended to other information-intensive professions. It is common, for example, to compare the professional liability of physicians and attorneys. Many courts "frequently and uncritically conclude that the rules governing legal and medical malpractice are identical."¹⁴⁰

Two significant distinctions exist, however, between legal and medical malpractice liability. First, the attorney has not been protected by geographical restrictions such as the locality rule to the same extent as have physicians.¹⁴¹ Second, the practice of law is not as formally specialized as the practice of medicine, although specialization exists tacitly.¹⁴² Attorneys are permitted to advertise themselves as specialists in only a few fields, such as admiralty, patent and trademark law, and areas that the state recognizes as constituting a specialized practice.¹⁴³

An important similarity between physicians and attorneys that tends to minimize their differences is the fact that an attorney's failure to keep abreast in law can easily result in malpractice liability. Failure to Shepardize cases can have disastrous consequences if cases relied upon are distinguished or overturned.¹⁴⁴ Currently, attorneys have a "grace period" of some weeks or months

140. Note, *Standard of Care in Legal Malpractice*, 43 IND. L.J. 771, 772 (1968). The court in *Citizens' Loan Fund & Sav. Ass'n v. Friedley*, 123 Ind. 143, 145, 23 N.E. 1075, 1075 (1890), stated that,

Attorneys are very properly held to the same rule of liability for want of professional skill and diligence in practice, and for erroneous or negligent advice to those who employ them, as are physicians, surgeons, and other persons who hold themselves out to the world as possessing skill and qualifications in their respective trades or professions.

141. RESTATEMENT (SECOND) OF TORTS § 299S makes allowances "for the type of community in which the actor carries on his practice," *Id.* at comment g. Yet a fundamental difference exists between the historic difficulties in disseminating scientific and medical information through rural areas and knowledge of uniformly applied state statutory and common law. A lawyer's professional conduct is "measured against the standard of an attorney who possesses and exercises with reasonable diligence that degree of knowledge, skill, and prudence commonly possessed and exercised by similarly situated attorneys." *Malpractice: Negligence and Branch of Contract*, LAWYERS MANUAL ON PROFESSIONAL CONDUCT (ABA/BNA) no. 19, at 301:102 (1984). However, an attorney's failure to "know the law" can be analogous to a "clear and obvious" breach of duty, such as failure to file suit before a statute of limitations runs.

142. See *Childs v. Comstock*, 69 A.D. 160, 74 N.Y.S. 643 (1902) (specialization was central in court's determination that malpractice defendant attorneys failed to meet required standard of care). Generally, states have been slow to recognize the emergence of the attorney specialist, except in a limited manner. See A. KAUFMAN, *PROBLEMS IN PROFESSIONAL RESPONSIBILITY* 464-87 (1976).

143. See MODEL CODE OF PROFESSIONAL RESPONSIBILITY EC 2-14, DR 2-105 (1979); MODEL RULES OF PROFESSIONAL CONDUCT Rule 7.4 (1983).

144. An attorney who fails to disclose adverse authority reasonably available to him and without

before the various Shepard's editions are updated. This period is reduced, theoretically, with the advent of "electronic Shepardizing." Presently, updating cases electronically is prudent; in the future, it may be required by professional standards.¹⁴⁵

The relationship between information management and the future of professional liability extends beyond attorneys and physicians, encompassing all professionals who may rely upon electronically managed information. Architects, accountants, industrial designers, engineers, business analysts, and others who are potential professional liability defendants will increasingly rely on electronically accessed databases for the information they need to perform their services.¹⁴⁶ Even if such professionals do not encounter liability on the basis of their own computer-assisted literature research, diligent plaintiffs' lawyers will apply electronic means to analyze more efficiently the conduct of the defendant and to use electronically-acquired information to help establish negligence.¹⁴⁷

excuse likely violates MODEL CODE OF PROFESSIONAL RESPONSIBILITY EC 7-23 (1979) and MODEL RULES OF PROFESSIONAL CONDUCT Rule 3.3 (1983). See *Golden Eagle Distrib. Corp. v. Burroughs Corp.*, 103 F.R.D. 124 (1984) (sanctions ordered against firm for failing to Shepardize distinguished authority without reasonable excuse).

145. See Dabney, *supra* note 102, at 37-38.

146. The vicarious liability of the physician for the negligence of assistants or subordinates under his control is a well-established doctrine based on principles of agency or master-servant law. 61 AM. JUR. 2D *Physicians, Surgeons & Other Healers* § 286 (1981). If information-based liability becomes a factor in the practice of medicine, later extending to other professions, it will no doubt be possible to hold professionals liable for the negligence of researchers under their employ, or to attach liability for an employee's negligent research to an institution through the doctrine of *respondeant superior*.

147. Medical literature appearing in textbooks or journals is a significant source of information for the malpractice lawyer. 1 D. LOUISELL & H. WILLIAMS, *MEDICAL MALPRACTICE* § 7.05 (1985). The plaintiff's attorney researching a malpractice claim can learn about variations in anatomy the physician may have encountered in treatment, the multiplicity of diagnoses available to the physician, complications, alternative treatments, concurrent diseases associated with the treated condition, and the probable success or failure rates of the selected treatment. *Id.* The general rule on the admissibility of periodicals and treatises is that, without a statutory exception, the hearsay rule prevents the introduction of such material as substantive evidence. For an example of such a statutory exception, see NEV. REV. STAT. § 51.255 (1985). The rules of admissibility, however, vary among jurisdictions. See also *Cross v. Huttenlocher*, 185 Conn. 390, 440 A.2d 952 (1981) (text excluded from plaintiff's evidence for their failure to discuss clearly specific drug treatment side effect plaintiff suffered); *State v. McDonald*, 222 Kan. 494, 565 P.2d 267 (1977) (statute permitted introduction of treatise as substantive evidence provided foundation laid through expert testimony); *Bivins v. Detroit Osteopathic Hosp.*, 77 Mich. App. 478, 258 N.W.2d 527 (1977) (text admissible for impeachment purposes but not for substantive purposes); *Lewandowski v. Preferred Risk Mut. Ins. Co.*, 33 Wis. 2d 69, 146 N.W.2d 505 (1966) (published materials admissible as substantive evidence provided judicial notice taken or expert testifies on the works' reliability). When the standard of care is at issue, specifically a physician's failure to conduct or to have conducted adequate computer-assisted research, the existence of medical journal articles overlooked by the physician, and perhaps their contents, would be admissible. These materials would not be excluded as evidence under the definition of hearsay if introduced to show negligent research rather than negligent treatment.

CONCLUSION

The computer will be applied to a broader variety of tasks in health care and other professions as information technology is refined and becomes an increasingly attractive alternative to traditional methods. The entrance of physicians and other professionals into the information age will result in changes in professional liability as profound as the changes in products liability brought about by industrialization.

Tort liability for all professionals is a serious problem. Higher costs for consumers, higher insurance premiums, and reduced availability of services must be remedied in some way. Legislative efforts to raise the plaintiff's burden of proof in order to discourage specious claims will probably not be effective if laws are based upon insulating factors, such as geography. Courts are freely capable of reinterpreting such standards in response to the growth of electronic information in health care professions.

All professionals, including physicians, who rely upon computer-assisted research for timely information should become sensitive to the potential for computer and information-based professional liability claims. Professionals and legislators need to develop guidelines to accommodate changes in professional liability as tort law moves into the information age. The courts and legislatures have an opportunity to be proactive rather than reactive in effecting these changes. Professional committees that study the impact of technology upon practice methods should carefully monitor and analyze the effects of the computer upon professional liability.