

Common Causes of Injury and Legal Action in Laser Surgery

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Objective: To identify common causes of legal action, injuries, claims, and decisions related to medical professional liability claims stemming from cutaneous laser surgery.

Design: Search of online public legal documents using a national database.

Main Outcome Measures: Frequency and nature of cases, including year of litigation, location and certification of provider, injury sustained, cause of legal action, verdict, and indemnity payment.

Results: From 1985 to 2012, the authors identified 174 cases related to injury stemming from cutaneous laser surgery. The incidence of litigation related to laser surgery shows an increasing trend, with peak occurrence in 2010. Laser hair removal was the most common litigated procedure. Nonphysician operators accounted for a sub-

stantial subset of these cases, with their physician supervisors named as defendants, despite not performing the procedure. Plastic surgery was the specialty most frequently litigated against. Of the preventable causes of action, the most common was failure to obtain an informed consent. Of the 120 cases with public decisions, 61 (50.8%) resulted in decisions in favor of the plaintiff. The mean indemnity payment was \$380 719.

Conclusions: Claims related to cutaneous laser surgery are increasing and result in indemnity payments that exceed the previously reported average across all medical specialties. Nonphysicians performing these procedures will be held to a standard of care corresponding to an individual with appropriate training; thus, physicians are ultimately responsible for the actions of their nonphysician agents.

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LASER SURGERY HAS PROLIFERATED tremendously for the past 2 decades with regard to aesthetic and medical therapy for the skin. Common applications of lasers include depilation,¹ removal of pigmented lesions,² tattoo removal,³ treatment of vascular lesions,⁴ and facial rejuvenation,⁵ among multiple other applications. Unsurprisingly, with the advent and increased use of laser technology in medicine has come a concomitant increase in lawsuits alleging malpractice arising out of the misuse of a laser device. This increase is partly attributable to the performance of laser surgery by untrained, nonphysician operators.⁶ Despite stringent regulatory requirements by the Food and Drug Administration regarding manufacturing and distribution, there is a lack of overarching federal regulation governing who can operate a laser, what procedures require physician supervision, and where the procedures are performed.

Indemnity payments for medical malpractice historically have increased,⁷ and as

more elective procedures are being performed, dermatologic surgeons as well as medical dermatologists performing procedural dermatology treatments are likely to face increasing claims. In an effort to identify common risk factors and errors, we sought to catalog common causes of action, allegations, injuries, and other trends associated with medical malpractice litigation secondary to cutaneous laser surgery.

METHODS

We searched the legal research resource Westlaw Next (<http://www.westlaw.com>) using a variety of keywords. This database is a primary source used by attorneys to gather legal information and is available by subscription to the public. It has been used in other works seeking to identify case law relevant to medical malpractice claims.⁸ Documents within this database are public record and include legal cases, jury verdicts and summaries, and trial court documents. The study was exempt from review, as determined by our institutional review board.

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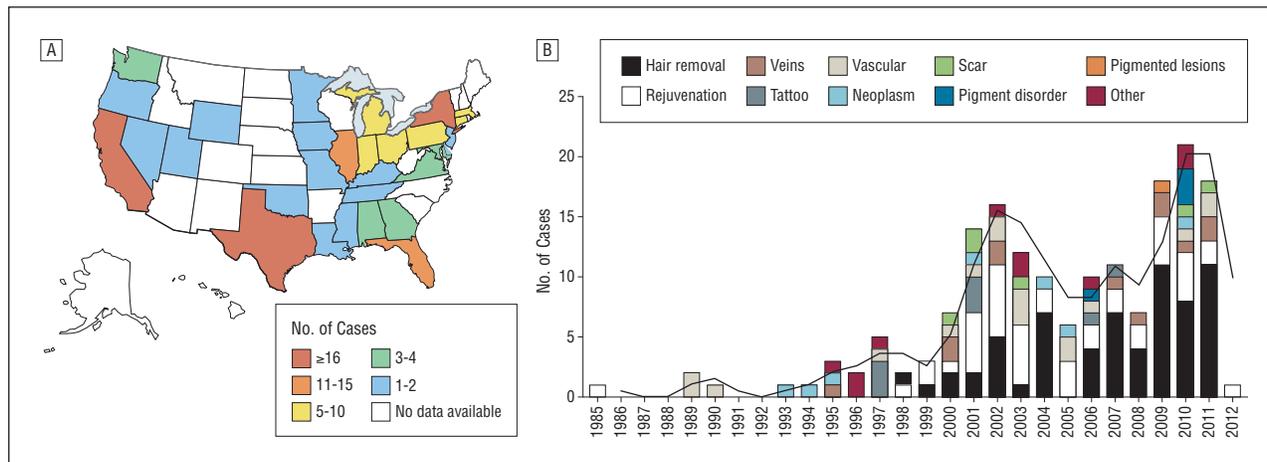


Figure 1. Distribution of cases by state (A) and frequency by year (B). Trend line in panel B represents moving average.

In an effort to be exhaustive, queries were not limited by state or date. The search terms included *laser & skin*, *laser & malpractice*, *laser & hair*, *laser & tattoo*, *laser & birthmark*, *intense pulsed light (IPL) & skin*, *IPL & skin*, *light and skin*, and *laser & resurfacing*. The searches yielded 1809 documents, including opinions, judgments, verdicts, and complaints. These documents were then independently reviewed in their entirety for relevance and sufficiency. They were analyzed for year of action; location of action; provider demographics, including degree or certification as well as subspecialty practice; nature of procedure, including alleged injuries sustained; cause of action; verdict; and indemnity payments. For some cases, information was incomplete and supplemented by reliance on the docket, if available, at the respective courthouse where the case was litigated. This search identified 174 cases concerning injury resulting from cutaneous laser surgery.

RESULTS

VENUE AND YEAR OF LITIGATION

One hundred seventy-four cases were identified that matched the search criteria and involved cutaneous injury after laser surgery. Cases from 30 states were identified, as well as 2 cases from the District of Columbia, and 4 from federal court. The highest number of cases originated from California ($n=27$), followed by New York and Texas ($n=23$ for each state). The distribution of cases by state is presented in **Figure 1A**. The dates of litigation ranged from 1985 to 2012, with the most cases occurring in 2010 ($n=22$). There were 2 relative peaks of incidence on the timeline (Figure 1B), with one peak occurring in 2001-2003 and the other in 2009-2011. There was an overall trend of increasing cases along this timeline.

PROVIDER AND SUBSPECIALTY

Plastic surgery had the most cases of any subspecialty, followed by dermatology. As is clear from the data, a significant number of physicians are offering or supervising laser skin treatments outside the scope of their specialty. **Table 1** lists the specialties of the physician operators or supervisors, where available.

Table 1. Training and Subspecialty Certification of 174 Laser Operators and Supervisors (When Applicable)

Physician Subspecialty ^a	No. (%)
Plastic surgery	45 (25.9)
Dermatology	37 (21.3)
General surgery	9 (5.2)
Otolaryngology	8 (4.6)
Family practice	8 (4.6)
Obstetrics and gynecology	8 (4.6)
Internal medicine	6 (3.4)
Ophthalmology	5 (2.9)
Unknown	3 (1.7) ^b
Orthopedic surgery	2 (1.1)
Radiology	2 (1.1)
Anesthesia	1 (0.6)
Physical medicine and rehabilitation	1 (0.6)
Preventative medicine	1 (0.6)
Vascular surgery	1 (0.6)
Nonphysicians ^c	
Physician extender ^d	34 (19.5)
Chiropractic	2 (1.1)
Podiatry	1 (0.6)

^aIncludes cases in which the physician was a laser operator or supervisor.

^bOne case in which the physician subspecialty could not be ascertained and 2 in which parties remained confidential.

^cNonphysician operators who performed procedures without supervising physicians.

^dIncludes physician assistants, nurse practitioners, registered nurses, aestheticians, and technicians.

Of the 174 laser-induced injury lawsuits, 100 (57.5%) identified a physician as the laser operator. Physicians in this case included allopathic and osteopathic physicians. Nearly 40% of the cases ($n=66$) involved a nonphysician operator, which included allied health professionals, such as chiropractors, podiatrists, nurse practitioners, and registered nurses, as well as non-health professionals, such as aestheticians and technicians. In 1.7% of the cases ($n=3$), no information was provided about the operator (ie, the defendant's identity was confidential) or the operator could not be determined from the circumstances or the parties to the litigation.

Table 2. Laser Operators Performing Procedure in Relationship to Parties Named in Litigation

Training	No. (%)	
	Operator (n = 174)	Defendant (n = 187) ^a
Physician (MD or DO) ^b	100 (57.5) ^c	138 (73.8)
Nonphysician	66 (37.9)	49 (26.2)
Unknown	8 (4.6)	NA

Abbreviation: NA, not applicable.

^aTotal number of defendants exceeds number of cases because plaintiff may seek recovery from multiple parties.

^bIncludes 3 cases in which both physician and nonphysician were operators.

^cOf the 100 physician operators, 95 were allopathic and 5 were osteopathic physicians.

Table 3. Laser Procedures Performed Resulting in Litigation

Procedures	No. (%)
Hair removal	63 (36.2)
Rejuvenation ^a	43 (24.7)
Vascular ^b	14 (8.0)
Leg veins	13 (7.5)
Tattoo	12 (6.9)
Neoplasm	7 (4.0)
Scar	6 (3.4)
Pigmentary disorder	4 (2.3)
Pigmented lesion	2 (1.1)
Other ^c	10 (5.7)
Total	174 (99.8)

^aThese cases included procedures with conventional ablative resurfacing, nonablative resurfacing, intense pulsed light, and both nonablative and ablative fractional lasers.

^bThis category encompasses treatment of vascular lesions as well as telangiectasia.

^cThese cases included 6 cases in which the specifics of the procedure were not disclosed, 2 cases related to fat removal, 1 case of skin tightening, and 1 case of psoriasis treatment.

Even though only 100 cases involved the operation of the laser device by a physician, 146 cases named the physician as a defendant. In contrast, of the 66 nonphysician operators, only 49 were named as a defendant. Finally, in 12 cases, the plaintiff sought to recover damages from the manufacturer of the laser. It should be noted that seeking recovery from one party does not preclude naming additional parties as defendants. These findings are summarized in **Table 2**.

PROCEDURES AND INJURIES

The most common procedure (n = 63) that ultimately resulted in litigation in the identified cases involved hair removal. "Rejuvenation" was the second most commonly litigated procedure (n = 43), comprising conventional carbon dioxide resurfacing, nonablative and ablative fractional resurfacing, and intense pulsed-light treatments. The remainder of the litigated procedures are listed in **Table 3** in order of decreasing incidence.

Injuries sustained as a result of laser surgery were varied and are summarized in **Table 4**. Burns (47.0%), scars

Table 4. Injuries Sustained Because of Laser Surgery

Injury	No. (%) ^a
Burns	86 (47.0)
Scars	71 (38.8)
Pigmentation	43 (23.5)
Disfigurement	29 (15.8)
Emotional distress	21 (11.5)
Physical suffering	20 (10.9)
Erythema	8 (4.4)
Diminished quality of life	7 (3.8)
Ulceration	6 (3.3)
Embarrassment	5 (2.7)
Eye injury	4 (2.2)
Death	4 (2.2)
Disability	2 (1.1)
Infection	1 (0.5)

^aThe sum exceeds 100% as multiple injuries were sustained in some cases.

(38.8%), and pigmentary alterations (23.5%) were the most common alleged injuries. Burns included both second- and third-degree burns, as well as full-thickness necrosis. Scars included hypertrophic scars, keloids, and atrophic scars. Pigmentary changes encompassed both hyperpigmentation and hypopigmentation. It is clear from the number of alleged injuries that some cases involved multiple injuries. This is clinically feasible because one injury does not necessarily preclude another sustained injury (eg, burns can result in scars and pigmentary change).

In addition to the cutaneous injuries, allegations of psychological injuries were prevalent, including emotional distress (n = 21), diminished quality of life (n = 7), and embarrassment (n = 5) secondary to sustained physical injuries. Notably, there were 4 cases of eye injury. Two deaths were related to complications of anesthesia: one from general anesthesia performed in conjunction with classic carbon dioxide resurfacing and the other from the excessive application of topical anesthesia in a hair removal procedure.

CAUSES OF ACTION

An action for medical malpractice is based on the negligent infliction of personal injury or wrongful death in the course of medical treatment by a provider who professed to have a special knowledge and skill in the practice of medicine. Thus, litigation arising out of injury caused by the misuse of a laser or light device is predicated on the legal concept of negligence, which is therefore implicit in these allegations.

Negligence, in its most rudimentary form, can be defined as the failure to act as a reasonably prudent individual would act under like circumstances. In cases involving physicians, the law holds them to the standard of a reasonably proficient physician. To properly plead an action in negligence against a physician, the plaintiff must allege and prove 4 elements: (1) the physician owed a duty of care to the plaintiff, (2) the physician's performance fell below the applicable standard of care, (3) the plaintiff suffered actual injury or loss, and (4) the loss

Table 5. Legal Causes of Action in Addition to Standard Causes of Action in Medical Malpractice Claims

Cause of Action	No. (%) of 174 Cases
Lack of informed consent	53 (30.5)
Fraud	15 (8.6)
Loss of consortium	13 (7.5)
Assault/battery	9 (5.2)
Strict products liability	9 (5.2)
Breach of contract	8 (4.6)
Infliction of emotional distress	8 (4.6)
Negligent misrepresentation	7 (4.0)
Gross negligence	5 (2.9)
Recklessness	5 (2.9)
Deceptive trade practices	5 (2.9)
Negligence per se	4 (2.3)
Other	16 (9.2)

or injury was proximately caused by the physician's breach of duty.

Not all causes of actions alleged in these lawsuits stem entirely from negligence and departure from the standard of care (**Table 5**). Lack of informed consent (n = 53) is alleged when a physician fails to apprise the patient of the risks associated with the recommended procedure and all medically reasonable alternatives before administering treatment. The failure to properly inform the patient may result in a decision by the patient that does not accurately represent his or her desires. Fraud and intentional misrepresentation (n = 15) and negligent misrepresentation (n = 7) are common causes of action that cover situations in which the physician, either intentionally or negligently, misled the patient regarding the physician's credentials or the efficacy and safety of the procedure. A plaintiff may also allege breach of contract (n = 8) insofar as the physician failed to execute the contract entered into with the patient.

Loss of consortium (n = 13) differs dramatically from the aforementioned causes of action insofar as the patient who suffered the injury cannot bring the cause of action. Rather, loss of consortium is a cause of action brought by a family member, usually a spouse, alleging that by virtue of the injury, he or she are now deprived of the relationship he or she once had with the injured party.

Specific allegations, although not available or discernible in all the cases surveyed, provide insight into how physicians can minimize their risk of litigation (**Table 6**). Failure to properly hire, train, or supervise staff was the most common specific allegation (n = 33) and echoes the finding that physicians are legally held liable for both the procedures they perform and those done by their delegates, provided that the employees are acting within the scope of their duties. Other notable allegations included failure to conduct a test spot (n = 17), failure to recognize and treat injury (n = 10), and failure to evaluate skin type (n = 7).

VERDICTS AND MONETARY AWARDS

Of the 174 cases reviewed, 120 (69.0%) included information on the ultimate disposition of the case. Of these,

Table 6. Specific Allegations (Where Available) Relating to Injury Sustained as a Result of Laser Surgery

Allegations	No.
Failure to properly hire, train, or supervise staff	33
Failure to properly perform treatment and/or operate laser	25
Failure to select appropriate laser and/or setting	20
Failure to warn and/or inform of risk	17
Failure to conduct test spot	17
Not trained and/or certified to operate laser	15
Failure to recognize and/or treat injury	10
Failure to evaluate skin type	7
Failure to properly calibrate laser	6
Failure to maintain laser	2
Failure to biopsy	1
Failure to supply goggles	1

Table 7. Disposition of Cases

Results	Total Cases, No. (%)	Known Decisions, No. (%)
Plaintiff judgment	32 (18.4)	32 (26.7)
Plaintiff settlement	29 (16.7)	29 (24.2)
Defendant judgment	59 (33.9)	59 (49.2)
Other ^a	38 (21.8)	0
Pending	16 (9.2)	0
Total	174 (100.0)	120 (100.1)

^a Case dismissal on joint motion, dismissal with or without prejudice either on joint stipulation of the parties or individual party motions.

32 cases resulted in plaintiff recovery through motion, judgment, or jury verdict, and 29 were settled out of court through arbitration, mediation, or some other form of alternate dispute resolution in favor of the plaintiff. The remaining 59 cases were disposed of in favor of the defendant. Thus, of the 120 cases for which the disposition was discernible, the split between plaintiff recovery and judgment in favor of defendant was nearly 50-50. These results are summarized in **Table 7**.

Of the 61 plaintiff recoveries, 37 contained information regarding the monetary damages awarded. The range of monetary awards was between \$5000 and \$2 145 000, with the mean and median awards being \$380 700 and \$350 000, respectively (**Figure 2**).

COMMENT

Several limitations on conducting research through a legal database are important to explain. First, although it is a massive database, only 1 legal database was searched. Cases within the database are those in which some form of legal action was taken, excluding complaints handled outside the judicial system (ie, third-party arbitration through malpractice carrier). This is likely to have excluded many frivolous claims with little merit. Second, the query was a retrospective review and limited by the search terms selected; there are probably some decisions that did not contain the searched terms. Third, as previously mentioned, information was not complete for

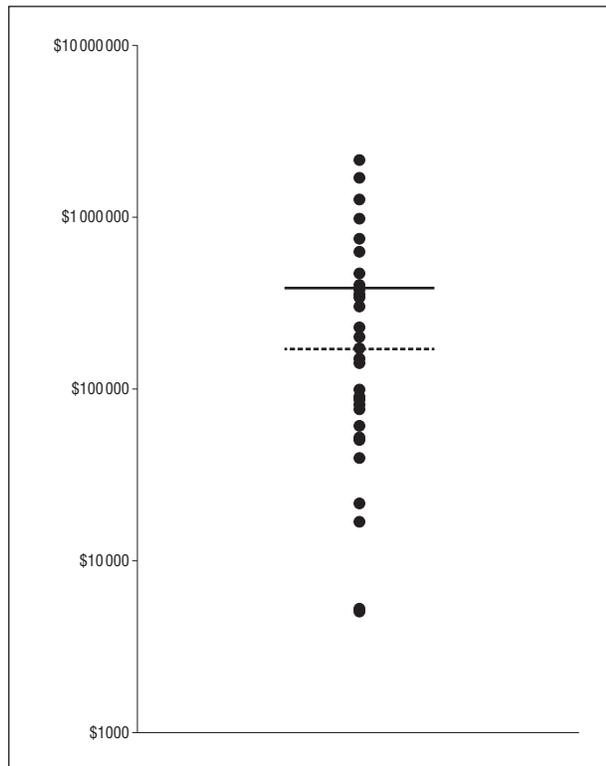


Figure 2. Available indemnity payments for the plaintiff decisions ($n = 37$), plotted on a logarithmic scale. Payments ranged from \$5000 to \$2 145 000. Solid line represents mean payment (\$380 700); dashed line, median payment (\$350 000).

all cases, even after it was supplemented through additional research. Fourth, a significant number of the cases are still pending. Finally, because these legal documents are lay documents (ie, not medical record), the facts presented were assumed to be true. Furthermore, lay terminology may elude a database search as used in this study.

Nonetheless, the data compiled through this research constitutes a large sample and review of laser-related litigation. Thus, the findings, although not completely exhaustive, are probably an accurate representation of the current jurisprudence and legal framework surrounding laser-related litigation. The data compiled through this research provide information regarding trends in litigation, common causes of action, and allegations and thereby serve as an invaluable source to physicians and nonphysician operators of laser devices who seek to reduce their propensity for liability.

With regard to venue distribution, most cases were in California, Texas, or New York. Clearly, the large populations of these states contribute to this distribution. The trend is also in line with the large number of elective cosmetic procedures performed in these states.⁹

Interestingly, 100 (57.5%) of the 174 laser-induced injury lawsuits reviewed had a physician (MD or DO) operator. These findings on operators should not be misinterpreted to suggest that operation of a laser by a physician results in a higher likelihood of injury. One factor, which is difficult to measure, is the tendency for physicians to undertake the laser surgery themselves instead of delegating to nonphysicians. It is quite plau-

sible that there are more physician operators of laser medical devices than nonphysician operators, but it is important to note that 38% of the cases involved operation by a nonphysician.

Even though only 100 cases involved the operation of the laser medical device by a physician, 138 named the physician as a defendant. The legal doctrine of *respondeat superior*—that is, imposing liability on employers for the negligence of their agents—and the state statutes holding supervising physicians liable for their delegated acts are the best explanation for this apparent discrepancy. The same reasoning can be applied to explain the discrepancy between the number of cases involving nonphysician operators and the number naming a nonphysician as a defendant. It is important to note that plaintiffs' attorneys typically sue parties who can satisfy a successful judgment, that is, insured defendants. Many nonphysician operators lack malpractice insurance and the financial means to pay a substantial judgment.

Comprising 47.2% of the total cases, plastic surgeons and dermatologists are the physicians most often litigated against. Because dermatologists developed most of these procedures and plastic surgeons focus on aesthetics, it is logical to assume that these 2 fields face the highest number of lawsuits simply because they perform more procedures than any other specialists. However, as is clear from the data, a large number of physicians are offering laser skin treatments outside the scope of their specialty.

The most common procedure that ultimately results in litigation involves hair removal. However, it should not be concluded that hair removal is inherently more risky or more likely to result in litigation than the other laser procedures. There are a number of other explanations. First, hair removal is by far the most commonly performed laser procedure,¹⁰ with more than 900 000 procedures performed in 2011 by plastic surgeons, dermatologists, and otolaryngologists.⁹ Second, several states do not require any licensing to perform laser hair removal, including New York and Texas, among the most represented states⁶; these lax laws allow for an increased number of nonphysician operators. Nonetheless, without more information, no definite conclusions can be drawn from the data.

Rejuvenation was the second most commonly litigated procedure. The vast majority of these procedures involved carbon dioxide resurfacing, a technique that has largely been abandoned because it involves a significant risk of hypopigmentation and scarring. It is interesting to note that 7.5% of cases involved laser treatment of leg veins, which accounts for a far smaller relative percentage of currently performed procedures.⁹ These data may reflect the inherent risk of complications with the treatment of leg veins, which in turn may put operators at risk for liability.

Specific allegations provide insight into how physicians could minimize their risk of litigation. First, physicians should ensure that their staff is trained and, if delegating a task, should supervise their staff to minimize the risk of injury or to truncate damage from injury should it occur. Second, laser operators should be careful when evaluating skin type and selecting the proper laser para-

meters for treatment. Finally, laser operators should bear in mind that in certain instances, it may be prudent to conduct a test spot before administering laser treatment, even though there are few data to support the utility of such practice.

This study also provided important insights into causes of action, verdicts, and indemnity payments. In a recent analysis of closed medical professional liability claims, improper performance of procedures was the most prevalent claim, with failure to supervise procedures and staff also included in this list.¹¹ With regard to indemnity payments, the mean and median payments across all specialties were roughly \$275 000 and \$110 000, respectively.¹² These figures are substantially lower than our findings, but the differences should be interpreted with caution. Previously published data on indemnity payments include all resolved claims, whereas our database search yielded only those that had some form of legal pleading. This variation in methodology may account for the discrepancy, and more studies are needed.

With regard to verdicts, our data reveal a nearly equal split between plaintiff and physician. This is in contrast to the findings that 22% of all medical malpractice claims¹² and 28.7% of claims in dermatology¹¹ result in indemnity payments. Our higher percentage probably reflects the fact that our study did not include claims that were abandoned before legal paperwork was filed.

In sum, it is clear that injury claims occur because of laser procedures. The allegations brought against laser operators should serve as a guide for safeguarding against the most common issues. Nonetheless, injuries will undoubtedly continue to occur. Physicians should take careful note of the laws and regulations in their state, specifically those that govern laser operation and the delegation thereof. In certain states, if supervision is required and not delivered, a physician's liability will more easily be established through litigation. Even if supervision is not required, physicians may still be liable for the misconduct of their agents.

It is not clear how the delegation to or the operation of lasers by nonphysicians affect jury awards or settlements. More research is warranted into this topic because such knowledge could help physicians make cost-effective decisions vis-à-vis delegation. These data clearly suggest that the onus of liability is placed squarely on physicians, and, despite the lack of federal regulation and conflicting state regulations, there is legal precedence to support this responsibility. Several physician groups have promulgated guidelines on the delegation of laser-related tasks to nonphysicians. For example, the American Society for Laser Medicine and Surgery guidelines provide that a properly trained physician may delegate tasks to nonphysician personnel so long as the "supervising physician [is] physically present on-site, immediately available, and able to respond promptly to any questions or problem[s]" during the procedure. Furthermore, nonphysician operators "must have appropriate documented training and education in the physics, safety, and surgical techniques of each system, be properly

licensed in their state if required, and be adequately insured for that procedure."¹³

Finally, physicians who are not specifically trained in the use of medical laser devices should bear in mind that when performing laser medical procedures, they will be held to the same standard of care expected of physicians trained in delivering these treatments. Thus, to minimize their liability, physicians performing these treatments should err on the side of caution and seek out the requisite training and/or licensing.

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