STATE OF MICHIGAN

IN THE SUPREME COURT

NAWAL DAHER and MOHAMAD JOMAA, as Co-Personal Representatives of the Estate of JAWAD JUMAA a/k/a JAWAD JOMAA, Deceased	Supreme Court No. 165377 Court of Appeals No. 358209
Plaintiffs-Appellees, v	Wayne County Circuit Court Case No. 2020-004169-NH
PRIME HEALTHCARE SERVICES-GARDEN CITY, LLC d/b/a GARDEN CITY HOSPITAL, a foreign limited liability company, KELLY W. WELSH, D.O., and MEGAN SHADY, D.O., jointly and severally, Defendants-Appellants.	

***AMICUS CURIAE* BRIEF ON BEHALF OF UNIVERSITY OF MICHIGAN**

INDEX TO EXHIBITS FOR *AMICUS CURIAE* BRIEF ON BEHALF OF UNIVERSITY OF MICHIGAN WITH EXHIBITS (FILED SEPARATELY)

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COUNTER-STATEMENT OF QUESTION PRESENTED

I. Michigan law bars recovery of "remote, contingent, or speculative damages" in a tort action. *Theisen v Knake*, 236 Mich App 249, 258; 599 NW2d 777 (1999). Did the Court of Appeals correctly apply this legal principle, in tandem with persuasive authority from two sister states, to build a framework for recovery of lost future earnings damages in child death cases that does not permit speculation or reliance on population-level statistics alone, but rather requires a jury to personalize an estimation of future lost earnings specific to the particular child?

Plaintiff-Appellee says "No."

Defendants-Appellants say "Yes."

The Trial Court did not reach this issue

The Court of Appeals says "Yes."

Amicus curiae University of Michigan says "Yes."

STATEMENT OF INTEREST OF *AMICUS CURIAE* UNIVERSITY OF MICHIGAN[1]

The University of Michigan (U-M) operates one of Michigan's largest healthcare systems. Like fellow *amici curiae* Corewell Health and McLaren Health Care, U-M has a strong interest in the medical malpractice laws governing actions against health care providers and healthcare facilities, including the laws governing damages available in medical malpractice and other wrongful death actions. With the state's largest group of maternal-fetal medicine (MFM) specialists managing high-risk pregnancies and deliveries, U-M has a particularly strong interest in the laws governing damages for fetuses and infants who, despite the best efforts of healthcare providers, are tragically lost before or during the birthing process or before their first birthdays.

Additionally, U-M employs the defendant physicians in the companion case to this case, *Zehel v Nugent*, Supreme Court Docket Nos. 165375, 165379. *Zehel* and *Daher* were argued and decided together in the Court of Appeals. The panel used the factual differences between the decedents in both cases—an infant in *Zehel* and a teenager in *Daher*—to illustrate the proper application of the framework it developed for determining whether a child decedent's lost earning capacity damages are too speculative. Respectfully, this Court cannot fully assess the question of what proofs are required to calculate a child decedent's lost earning capacity without considering the facts in *Zehel*, where the Court of Appeals found that the absence of any "personal characteristics" shown by a newborn meant that a jury necessarily could not make "an estimation [of lost earning capacity] specific to that particular child." *Zehel v Nugent*, 344 Mich App 490, 509; 1 NW3d 387 (2022). U-M has a vested interest in the Court's decision in this case, as both a

[1] In accordance with MCR 7.312(H)(5), *Amicus Curiae* University of Michigan states that neither Appellants' counsel nor Appellees' counsel authored this brief in whole or in part, or contributed money that was intended to fund the preparation or submission of this brief. Further, no person and/or entities, other than University of Michigan, has contributed money for the preparation and submission of this brief.

healthcare provider and as the employer of the defendants in the companion case, which is being held in abeyance pending the Court's decision in this case.

INTRODUCTION

To be clear, U-M agrees fully with the arguments set forth by Defendants-Appellants Prime Healthcare and the other *amici curiae* in favor of reversing the Court of Appeals' decision overruling *Baker v Slack*, 319 Mich 703; 30 NW2d 403 (1948) and its limitation on future economic damages available under Michigan's Wrongful Death Act. U-M's primary position, as set forth more fully in its briefs filed in *Zehel*, is that the Court of Appeals erred by relying on *Denney v Kent Co Rd Comm'n*, 317 Mich App 727; 896 NW2d 808 (2016), as authority for expanding the recovery of lost financial support enumerated in the Wrongful Death Act to include the recovery of the full measure of a decedent's future lost earning capacity. However, as that issue has been fully and exhaustively briefed by Prime Healthcare and the other *amici curiae*, U-M's brief will instead focus on the second half of the *Daher/Zehel* opinions: the proper measure of lost earning capacity damages for a child decedent's estate.

If this Court rules that a child decedent's estate is able to recover lost earning capacity damages under the Wrongful Death Act, it should adopt the framework for measuring those damages set forth by the Court of Appeals in *Zehel* and *Daher*. The Court of Appeals correctly applied existing Michigan law and persuasive authority from two sister states to create a useful and reasonable framework for trial courts to determine whether a child decedent's future lost earning potential is too speculative to permit recovery. By requiring the plaintiff to show some evidence of the child's personal characteristics, aptitude and influences, the framework ensures that any lost earnings award is "an estimation specific to that particular child," *Zehel*, 344 Mich App at 509, and not simply an academic exercise in population-level statistics.

After determining that *Denney* permitted recovery of future lost earning capacity in a death case, the Court of Appeals in *Zehel* and *Daher* analyzed the evidence supporting the plaintiff

estates' claims for lost earning capacity and lost household services. Both plaintiff economic experts in *Zehel* and *Daher* supported their projections of the decedents' respective lost earning capacities with similar evidence: charts showing the average income expectations for an adult with the decedent's race and gender, calculated three different ways using the assumption that the decedent would have earned a high school diploma, completed some college, or earned a college degree.

The court acknowledged that "recovery of damages is not precluded 'for lack of precise proof,'" and that "loss of earning capacity damages" encompassed the income a person could have, rather than would have, earned. *Daher v Prime Healthcare Services-Garden City, LLC*, 344 Mich App 522, 531-532; 1 NW3d 405 (2022), quoting *Hannay v Dep't of Transp*, 497 Mich 45, 79, 80-82; 860 NW2d 67 (2014). "Nevertheless, the calculation must still be reasonably based on some evidence." *Id*. at 532, citing *May v William Beaumont Hosp*, 180 Mich App 728, 756; 448 NW2d 497 (1989). The panel cited *Thompson v Ogemaw Co Bd of Road Commrs*, 357 Mich 482, 489-492; 98 NW2d 620 (1959), a case applying the *Baker* standard, as permitting recovery of a teenage decedent's future lost earning capacity, where "there was evidence that the decedent had been healthy, intelligent, industrious, and had a history of earning money and contributing to family support, all of which 'could reasonably be forecast into the future.'" *Daher*, 344 Mich App at 533. The panel then examined two cases from Ohio and Pennsylvania allowing the parents of an 11-year-old son and several teenagers to recover their deceased children's expected future earning potential. *Id.* at 534-535. These damages were not impermissibly speculative because there was evidence presented of each teenager's educational and career plans, and the 11-year-old's "age, mental and physical characteristics, activities, and plans for his future." *Id*. at 534.

Applying these legal principles to the facts of *Zehel* and *Daher*, the panel reached different results as to whether the future lost earning claims in each case were too speculative. In *Daher*, the panel concluded that "it seems highly likely that the future earning potential of a 13-year-old can be proven with reasonable certainty based on personal characteristics known at the time":

> We think the above cases establish that a child's expected future earning potential is not *inherently* too speculative to permit recovery. The touchstone is whether that future earning potential can be proven with reasonable certainty based on the child's unique and known traits and abilities. There is no reason why the child must have an employment history. We decline to specify how old is "old enough," because different people mature at different rates, so that inquiry will inevitably depend on the specific child at issue. Nevertheless, it is well-known that at least by the end of middle school, it is common for teachers or other adults in a child's life to perceive when a child shows promise in a field, has any particular aspirations or strengths, displays developed personality characteristics such as conscientiousness or the kind of social adeptness that would likely evolve into adult networking skills, and so on. Furthermore, it is also well-known that a child's environment, including the child's parents, school system, general area of residence, participation in extracurricular activities, exposure to traumas or role models, and similar extrinsic influences will affect the child's future earning potential. We do not purport to set forth an exhaustive list of characteristics and influences, nor do we suggest that any of the above characteristics and influences are necessary. We hold only that it seems highly likely that the future earning potential of a 13-year-old can be proven with reasonable certainty based on personal characteristics and influences known at the time, and we unequivocally reject the proposition that the future earning potential of a 13-year-old categorically cannot be proven with reasonable certainty.

Daher, 344 Mich App at 535-536 (emphasis original).

Conversely, in *Zehel*, the panel concluded that calculation of future earning potential "is intrinsically too speculative for an infant who was born prematurely and who never had an opportunity to demonstrate any personal characteristics that would permit extrapolation:"

> We think the above cases establish that a child's expected future earning potential is not *inherently* too speculative to permit recovery. However, the record must permit some reasonable basis for personalizing an estimation specific to that particular child. In this case, tragically, there is simply no way to know anything about Rowyn's interests, aspirations, personality, strengths and weaknesses, academic performance, or any other characteristic that could be extrapolated. Rowyn was born prematurely and, implicitly, may have been conscious for two hours, if that. Rowyn never had the chance to display any individual personality whatsoever, and we think it too speculative to extrapolate from her parents or

> sibling. Unfortunately, on these facts, we must agree with defendants that there is no possible evidence of *Rowyn's* potential for future earnings.
>
> We are therefore constrained to conclude that defendants are entitled to summary disposition in their favor as to plaintiff's claims for lost future earning potential.

Zehel, 344 Mich App at 509 (emphasis original).

The differing outcomes in *Zehel* and *Daher* illustrate that the Court of Appeals crafted a workable standard for determining when a child decedent's lost earning capacity is too inherently speculative to be awarded under longstanding Michigan law prohibiting recovery of speculative damages. As explained *infra*, the framework is legally and logically sound, and entirely consistent with Michigan law, including past cases from this Court permitting the recovery of lost financial support damages by the estates of older children. For younger children, and particularly for newborns and infants who never had the opportunity to display any relevant personal characteristics, population-level statistics simply cannot provide a reasonable basis for the jury to assess such damages without resorting to speculation.

For hospital systems like U-M which employ a significant number of maternal-fetal medicine specialists, allowing speculative lost earning damages to inflate the value of infant death cases by tens of millions of dollars would threaten the availability of specialized care for the mothers and babies who need it most. MFM doctors, by design, take on the most complicated and highest-risk pregnancies, which necessarily carry a greater risk of poor outcomes. A ten-fold or greater increase in liability exposure for this subspecialty would discourage obstetricians from taking on this practice and would threaten U-M's ability to provide these vital services for Michigan's high-risk pregnancies. For these reasons, and the reasons set forth in the briefs of Prime Healthcare and the other *amici curiae*, this Court should reverse the Court of Appeals opinion in its entirety, or alternatively, affirm the opinion in its entirety.

ARGUMENT

I. The Court of Appeals correctly applied controlling Michigan law on damages and persuasive authority from sister states to find that a claim for a newborn's future lost earning is intrinsically too speculative, while leaving the door open for recovery of such damages in cases involving older child decedents.

A. Michigan law, including the cases cited by Plaintiff, has always barred recovery of remote, contingent or speculative tort damages.

There is no error in the Court of Appeals' analysis of the "speculative" damages issue. This Court and the Court of Appeals have long maintained that "[r]ecovery is not permitted in a tort action for remote, contingent, or speculative damages." *Theisen v Knake*, 236 Mich App 249, 258; 599 NW2d 777 (1999); see also *Hannay*, 497 Mich at 78 (barring recovery of tort damages that are "remote, contingent or speculative"); *Sutter v Biggs*, 377 Mich 80, 86; 139 NW2d 684 (1966) ("remote, contingent or speculative damages are not considered in conformity to the general rule" of tort recovery); *Price v High Point Oil Co, Inc,* 493 Mich 238, 255; 82 NW2d 660 (2013) (citing *Sutter*'s "general rule" but finding it inapplicable in tort cases involving only property damage); *Van Keulen & Winchester Lumber Co v Manistee and Northeastern Railroad Co,* 222 Mich 682, 687; 193 NW 289 (1923) ("remote, contingent or speculative damages will not be considered in conformity to the general rule above laid down"); *Woodyard v Barnett*, 335 Mich 352, 358; 56 NW2d 214 (1953) (same); *Fisk v Powell*, 349 Mich 604, 613; 84 NW2d 736 (1957) (rejecting alleged damages as "remote, speculative and contingent"). The Court of Appeals has observed that "[u]ltimately, to conclude that a person injured at birth would have followed any particular career path 'but for' the injury is the hallmark of 'speculation,' and it is well established that a plaintiff may not recover tort damages that are speculative or contingent." *Craig v Oakwood Hosp*, 249 Mich App 534, 543 n 2; 643 NW2d 580 (2002), *rev'd on other grounds*, 741 Mich 67; 684 NW2d 296 (2004).

This rule against recovery of remote, speculative or contingent damages has its roots in the case Plaintiff principally relies upon, *Allison v Chandler*, 11 Mich 542 (1863). The plaintiff in *Allison* was a jewelry store owner who was deprived of the enjoyment of his leased premises when the landlord literally removed the roof from the building, forcing the store owner to relocate his business to a less well-traveled location. The question before the Court was whether the plaintiff's recovery was limited to the difference between the rent paid at the new location and the rent plaintiff otherwise would have paid, or whether the plaintiff could also recover the profits he lost upon moving his business to a different, less busy location. *Id.* at 544-546. After considering and rejecting the contract standard for measuring damages (those that are within the contemplation of the parties at the time of entering into the contract), the Court explained that, in tort cases, complete certainty as to the measure of damages is not required. *Id.* at 555-556. The Court cautioned trial court judges to instruct the jury "to prevent the allowance of such [damages] as may be merely possible, or too remote or fanciful in their character to be safely considered as the result of the injury." *Id.* at 556.

In *Allison*, the plaintiff had substantial evidence of his business' past profits in its original location so as to establish a clear loss of profits and good will as a result of his eviction. The Court again cautioned judges against allowing lost profit damages "in all cases without distinction; for there are some cases where they might, in their nature, be ***too entirely remote, speculative or contingent, to form any reliable basis for a probable opinion***." *Id.* at 559 (emphasis supplied). "Reasonable certainty," as opposed to absolute certainty (which the *Allison* Court deemed an "impossibility"), was the evidentiary standard set by the *Allison* Court for a plaintiff to recover

lost profits without undue speculation. *Id.* at 560.[2] Past profits were identified as a "very material aid to the jury in arriving at a fair probable estimate of the future profits..." *Id.* Thus, while this Court's opinion in *Allison* recognized that a plaintiff's inability to precisely quantify lost profit damages was not a bar to seeking those damages, it concurrently recognized that there are and will be cases where the damages are simply too remote, contingent or speculative to allow a jury to determine them with any "reasonable certainty." See also *Stimac v Wissman*, 342 Mich 20, 28; 69 NW2d 151 (1955) (stating for the first time that "[w]e do not, however, in the assessment of damages, require a mathematical precision in situations of injury where, from the very nature of the circumstances, precision is unattainable. We do require that the amount of profit lost be shown with such ***reasonable certainty*** as the situation permits") (emphasis supplied). Reasonable certainty was and is this Court's guiding standard for determining damages.

Plaintiff cites *Godwin v Ace Iron & Metal Co*, 376 Mich 360; 137 NW2d 151 (1965), another economic tort case from this Court which adopts the statements from *Allison* regarding "uncertain" damages, and does not reject *Allison*'s recognition "that there are some cases where [damages] might, in their nature, be too entirely remote, speculative or contingent, to form any reliable basis for a probable opinion." 11 Mich at 559; see also *Story Parchment Co v Paterson Paper Co*, 282 US 555, 564 (1931) (same).[3] Statements in *Allison* and *Godwin* about the degree of certainty the "nature of the case" permits do little to illuminate whether the nature of this case—medical malpractice—permits a greater or lesser degree of certainty. While future damages are not

[2] "But generally, in an action purely of tort, where the amount of profits lost by the injury can be shown with ***reasonable certainty***, we think they are not only admissible in evidence, but that they constitute, thus far, a safe measure of damages; as when they are but another name for the use of a mill...or for the use of any other property where the value or profit of the use can be made to appear with ***reasonable certainty*** by the light of past experience...." *Id.* (emphasis supplied).

[3] The portion of *Story Parchment* quoted by Plaintiff at page 54 of his Brief does not cite to *Allison*, as Plaintiff suggests, but rather to a New York case. 282 US at 562.

categorically barred because the means of their estimation are "imprecise," there is a limit to the degree of imprecision this Court will allow. That limit was expressed in *Allison*, and has never been overturned. Simply because that limit was not reached in the economic tort cases Plaintiff cites does not mean that it was not reached in *Zehel*.

Plaintiff urges this Court to cast aside the limits expressed in *Allison* and instead adopt the draft position of the Restatement Third of Torts on the proper measure of lost earning capacity damages for seriously injured or deceased children (Plaintiff's Brief, pp 55-57, quoting Restatement (Third) of Torts: Remedies § 18 (Tentative Draft No. 2, 2023)). Plaintiff fails to mention that the cited Restatement section is a tentative draft and therefore does not represent the consensus of the American Law Institute. It certainly does not reflect Michigan law and the "reasonable certainty" standard set forth in *Allison*. This Court recently refused to adopt a different, fully approved section of the Restatement Third regarding premises liability in *Kandil-Elsayed v F & E Oil, Inc*, 512 Mich 95, 131, 143-145; 1 NW3d 44 (2023) (declining to adopt Restatement (Third) of Torts: Phys & Emot Harm § 51 (2012)). It should exercise even more caution here and reject Plaintiff's invitation to adopt a draft restatement of the law that does not reflect Michigan's own jurisprudence.

B. The framework set forth in this case and *Zehel* allow recovery of a child decedent's future lost earnings in most cases, consistent with prior decisions of this Court.

This Court cannot improve upon the lost earning capacity framework the Court of Appeals developed using this Court's long-established precedent. The Court of Appeals panel walks the same line established in *Allison*, and appreciates the same distinction. In both *Daher* and *Zehel*, the panel concludes from its review of the relevant case law that "a child's expected future earning potential is not *inherently* too speculative to permit recovery." *Zehel*, 344 Mich App at 509; *Daher*, 344 Mich App at 535 (emphasis original). The panel then explains that, "the record must permit

some reasonable basis for personalizing an estimation specific to that particular child," *Zehel*, 344 Mich App at 509, and that "[t]he touchstone is whether that future earning potential can be proven with reasonable certainty [the *Allison* standard!] based on the child's unique and known traits and abilities." *Daher*, 344 Mich App at 535-536.

In *Daher*, the court's focus on "the child's unique and known traits and abilities," including "aspirations or strengths" and "developed personality characteristics such as conscientiousness or the kind of social adeptness that would likely evolve into adult networking skills" allows a jury to award future lost earning capacity damages without undue speculation about the likelihood of future earning potential, even when the child has no established work history. *Id.* at 536. This flexible standard echoes other legal standards applicable to children, in recognition of their still-developing abilities. See, e.g., *Estate of Goodwin by Goodwin v Northwest Michigan Fair Ass'n*, 325 Mich App 129, 160-162; 923 NW2d 894 (2018) (discussing "tender-years rule" and "reasonable-child" version of open and obvious danger doctrine, and recognizing that the age of seven has been treated as a "dividing line" in Michigan). However, as the court notes in *Zehel*, an individualized assessment of one's ability to function generally, let alone to achieve a certain education or income, is simply impossible when the subject is only days old. 344 Mich App at 509. Without any indication of whether the *Zehel* infant, born ten weeks premature, would be capable of achieving the education and work life attained by her parents, it is "too speculative to extrapolate" her future earning potential from her parents or sibling. *Id.* The differing results reached in *Daher* and *Zehel* illustrate the *Allison* rule in action.

As noted by the panel, this evidence-based standard is consistent with this Court's opinion in *Thompson v Ogemaw Co Bd of Road Commrs*, 357 Mich 482, 488-489; 98 NW2d 620 (1959). The *Thompson* Court examined the degree of definitive evidence required to support a claim for

lost earning capacity for a 15-year-old decedent. The evidence showed that the decedent was "an intelligent, healthy girl" who completed her high school requirements while working as a babysitter and performing four to six hours of housework per day while her mother worked as a cook. *Id.* at 485. There was further evidence that the decedent planned to take her mother's job to support her family after graduation. *Id.* at 486. Thus, the "[l]ack of proofs of an exact quality" as to the decedent's future earnings did not preclude recovery of those damages as too speculative. *Id.* at 490. The recovery of this teenage decedent's lost earning capacity fits comfortably within the framework stated in *Zehel* and *Daher*.

The other Michigan child decedent cases cited by Plaintiff would likewise be resolved the same way under the *Zehel*/*Daher* standard.[4] Two cases, *Love v Detroit, J & C R Co*, 170 Mich 1; 135 NW2d 963 (1912), and *Bos v Gaudio*, 267 Mich 517; 255 NW 349 (1934), involved five-year-old decedents with no evidence of abnormal developmental histories or extreme prematurity. The defendant in *Bos* did not challenge the sufficiency of the evidence to show future earning capacity, although this Court ordered remittitur of the verdict and noted "[w]e cannot even conjecture how the jury arrived at its award, since we do not know upon what assumptions the award was based." 267 Mich at 521-522. In *Love*, the decedent's family physician testified that he "had known this boy ever since he was born. He was a vigorous, healthy boy, and had been during his whole life." 170 Mich at 11. The *Love* Court instructed that the jury should consider "testimony as to the child's status and future prospects and the vocations and their remuneration which might reasonably be expected to be open to him." *Id.* at 8. Setting aside that these cases were decided in an era where child labor was commonplace and children were legally considered the chattel of

[4] Note, however, that all of these cases except *Thompson* were decided under the survival act and not the post-1939 Wrongful Death Act examined in *Baker*. They should not be read as support for the ability to recover future lost earning capacity damages under today's Wrongful Death Act.

their parents, it is true even today that parents routinely assess their children's "unique and known traits and abilities" beginning at age five, when the decision is made to place a child into regular or "transitional" kindergarten. *Daher*, 344 Mich App at 536.[5]

Another case, *Black v Michigan Central R Co*, 146 Mich 568, 573; 109 NW 1052 (1906), involved a seven-year-old decedent that the evidence showed was "healthy, intelligent, of an excellent disposition, and obedient to his parents." The *Zehel/Daher* standard would likewise permit recovery of his future lost earning potential. The same is true for other Michigan cases involving eleven and fourteen-year-old children. *Sadlowski v Meeron*, 240 Mich 306; 215 NW 422 (1927); *Nicholas v Maxwell Motor Corp*, 237 Mich 612; 213 NW 128 (1927) (fourteen-year-old decedent was learning carpentry trade). In a case involving the death of a seven-year-old boy brought under the Federal Tort Claims Act, the Fifth Circuit applied the holdings in *Allison* and *Story Parchment* to find that recovery of the child's lost earning potential and household contributions was not unduly speculative, because the record contained evidence of the child's happy and obedient disposition, above-average grades, independence, and lack of physical deformities. *Hoyt v US*, 286 F2d 356, 360-361 (CA 5, 1961). None of these cases contradict the *Zehel* panel's decision to find the future lost earning potential of a newborn born ten weeks premature too speculative to permit recovery. *Zehel* and *Daher* have merely applied established law. They do not conflict with these cases.

[5] "Transitional Kindergarten" is offered in many Michigan public schools for children who will turn five between June 1 and December 1, and whose parents feel they would benefit academically and socially from an extra year of early education before beginning traditional kindergarten. See Shapiro, A., et al. (2023). *Michigan Transitional Kindergarten: A First Look at Program Reach and Features*. Ann Arbor, MI: Education Policy Initiative at the University of Michigan https://edpolicy.umich.edu/research/epi-policy-briefs/michigan-transitional-kindergarten-first-look-program-reach-and-features (accessed March 22, 2024).

C. In birth injury cases, it is inaccurate to claim that medical providers "create the uncertainty" of an infant's lost earning capacity.

Plaintiff relies on the statement that recovery of damages is not precluded "for lack of precise proof" when the defendant's wrongful actions "created the uncertainty" or "caused the imprecision" (Plaintiff's Brief, p 58, citing *Hannay*, 497 Mich at 79). This maxim is ill-suited to cases involving death during the birthing process or shortly thereafter, where it is inherently unclear what amount of injury resulted from the birthing process and what injuries or deficits may have occurred *in utero*. Where an adult or an older child is injured, a clear "before and after" comparison of deficits and abilities is available, and it can fairly be determined what injuries were present before and after the alleged malpractice. With infant cases (particularly premature infant cases), it is difficult and in some cases impossible to know what deficits were caused by the alleged birth injury and which would have been present regardless of how successful the birthing process was. The *Zehel* infant, born ten weeks premature, is a fitting example. The defendants in *Zehel* are not accused of causing her premature birth, but are accused of causing her inability to work, with no consideration of whether complications from her prematurity alone would have rendered her unable to work or limited her earning capacity regardless of whether her birth was traumatic. Notably, her surviving twin has experienced learning disabilities and developmental delays, even though his delivery was not traumatic (**Exhibit A**, Vasquez dep, pp 25-30). The analysis is even more complicated in cases where the infant suffers from a congenital condition or birth defect, or experiences *in utero* trauma such as a stroke or other interruption of blood supply or oxygen.

More fundamentally, the "created the uncertainty" standard addresses an economic tort duty that simply does not translate to allegations of medical malpractice. In *Purcell v Keegan,* 359 Mich 571, 576; 103 NW2d 494 (1960), this Court quoted the "precision is unattainable" standard

from *Stimac* and added, "[p]articularly this is true where it is defendant's own act or neglect that has caused the imprecision." The context of the statement is key to understanding its proper use.

In *Purcell*, the plaintiff's testimony regarding hours worked was sufficient to establish a claim for failure to pay overtime, despite his inability to produce written records of the overtime worked. The Fair Labor Standards Act required the employer, not the employee, to "make, keep and preserve" records of the employee's hours worked and wages paid. *Id.* at 574. The plaintiff's lack of specific proofs, therefore, was due to the employer's failure to comply with the FLSA, and not the plaintiff's lack of diligence. "In short, defendant seeks to take advantage of his own neglect to defeat the plaintiff's statutory cause of action." *Id*. Under these circumstances, this Court found that the burden of proof as to hours worked shifted to the employer "to come forward with evidence of the precise amount of the work performed or with evidence to negate the reasonableness of the inference to be drawn from the evidence of the employee." *Id.* at 576. Thus, the "neglect" of the defendant in *Purcell* which created a tolerable uncertainty as to the precise amount of damages was a literal failure to produce the relevant evidence which the defendant had the duty to produce, and not a generalized "neglect" in causing an injury.

The problem with applying *Purcell*'s holding to a personal injury action is that its emphasis on the "neglect" of the defendant in preserving the documents necessary to establishing the plaintiff's damages does not transfer to any corresponding duty held by the defendant in a personal injury action with respect to the plaintiff's proofs on damages. The defendants here and in *Zehel* did not fail to preserve or produce anything related to the proofs on damages in this case. Unlike in *Purcell*, the defendants' alleged "act or neglect" is alleged to have caused the injury itself, and not any "imprecision" in determining the amount of damages.

D. The Court of Appeals properly considered out-of-state cases for their persuasive value.

Plaintiff criticizes the Court of Appeals for relying on child decedent cases from Pennsylvania and Ohio for their persuasive value regarding recovery of a child's lost earning capacity (Plaintiff's Brief, p 51 n 23). Plaintiff's criticism lacks merit, as both cases are consistent with the Michigan cases discussed *supra*. In *Howard v Seidler*, 116 Ohio App 3d 800; 689 NE2d 572, 579 (1996), recovery of an eleven-year-old decedent's lost earning capacity was permitted, based on testimony "regarding [his] age, mental and physical characteristics, activities, and plans for his future," as well as his "family background and the education and earning capacity of other members of his family." He "was a normal eleven-year-old boy who had a good relationship with his family and who had aspirations to do something with his life in adulthood." *Id.* at 580. There was evidence that his sister had provided financial support to their mother, which laid proper foundation for the issue of whether the decedent would also have provided support in adulthood to his mother. *Id*. The analysis fits neatly within the *Thompson* framework and is persuasive for that reason.

Similarly, the Pennsylvania case of *Mecca v Lukasik*, 366 Pa Super 149; 530 A2d 1334, 1340 (1987) involved the estates of teenage decedents that were allowed to recover their lost earning capacities based on individualized showings of each decedent's future plans for college and/or the workforce, as expressed to their family members. These plans, coupled with evidence that the family members of each decedent had achieved the same or similar vocational and educational goals, provided a proper foundation for the recovery of lost earning capacity damages. Both *Mecca* and *Howard* were properly considered by the Court of Appeals panel in *Zehel* and *Daher* for their persuasive value, and the panel did not contradict Michigan law by incorporating their analysis into the framework for calculating lost earning capacity in child decedent cases.

Neither case finds that statistical data alone lays a proper foundation for calculation of a child decedent's lost earning capacity.

E. Cases from other states likewise allow recovery of a child's lost earning capacity only where individualized proofs are available.

Plaintiff cites a number of cases from other states that allow recovery of an injured or deceased child's lost earning capacity (Plaintiff's Brief, pp 54-55, Addendum). Most of these cases stand for the proposition, already endorsed by the *Daher* panel, that a lack of past wage earning history does not preclude an award of future lost earning capacity. Many involve children who, though referred to by the courts as "infants," were old enough to have some medical and/or educational history prior to their injury that would allow a jury to reliably assess the difference between their pre-injury and post-injury aptitude. *Murray v Sanford*, 226 Ga App 591; 487 SE2d 135 (1997) (age 17); *Childs v US*, 923 F Supp 1570 (SD Ga 1996) (age 6); *Greyhound Lines, Inc v Sutton*, 765 So2d 1269 (Miss 2000) (ages 8, 3 and 1); *Lesniak v County of Bergen*, 117 NJ 12; 563 A2d 795 (1989) (age 7) (finding that the plaintiff has an "obligation to furnish the jury with some evidentiary and logical basis for calculating or at least, rationally estimating a compensatory award"); *Slavin v Gardner*, 274 PA Super 192; 418 A2d 361, 362 (1979) (2.5-year-old child "in excellent health, of normal intelligence"); *Thoreson v Milwaukee & Suburban Transport Co*, 56 Wis2d 231; 201 NW2d 745 (1972) (age 3); *Roth v Law*, 579 SW2d 949 (Ct Civ App Tex 1979) (age 6). Others involve purely physical injuries to a cognitively normal child, where the "before and after" evidence of diminished earning capacity is obvious. *Roth*, *supra* (eye injury); *Zhao v United States*, 963 F3d 692 (CA 7, 2020) (shoulder dystocia); *Alvis v Henderson Obstetrics, SC*, 227 Ill App 3d 1012; 592 NE2d 678 (1992) (kidney injury). One case was reversed on appeal, *Tarpeh-Doe v US*, 28 F3d 120 (CA DC, 1994). Other cases did not challenge the newborn's lost

earning capacity award as unduly speculative. *Vincent v Johnson*, 833 SW2d 859 (Mo 1992); *Jones v MetroHealth Medical Center*, 89 NE3d 633 (Ohio App 8th Dist 2017).

Plaintiff acknowledges that Michigan is joined by at least two other states in requiring more than mere statistical evidence to calculate future lost earning capacity. This Court should be guided and persuaded by the Supreme Court of Virginia's decision in *Bulala v Boyd*, 239 Va 218; 389 SE2d 670 (1990), and the North Carolina Supreme Court's decision in *DiDonato v Wortman*, 320 NC 423; 358 SE2d 489 (1987). In *Bulala*, the court rejected an expert economist's method of calculating an infant's lost earning capacity simply by multiplying the median income for women in metropolitan areas in Virginia by the national average work life expectancy. That method, like the method used by Plaintiff's expert Dr. Thomson, is "purely statistical" and "too remote to permit an intelligent and probable estimate" of the infant's lost earning capacity. *Id.* at 678.

In *DiDonato*, the court contrasted the death of a "very young child," for whom "at least some facts can be shown to aid in estimating damages as, for example, its mental and physical condition," with the death of a stillborn child, where "even these scant proofs can[not] be offered." 320 NC at 431. While recognizing "that the damages in any wrongful death action are to some extent uncertain and speculative," the court acknowledged, as did the Court of Appeals here, that "our liberality in allowing substantial damages where the proofs are relatively speculative should not preclude us from drawing a line where the speculation becomes unreasonable." *Id.* These cases demonstrate support for the Court of Appeals' framework permitting recovery of a child decedent's earning capacity unless a lack of individualized proofs as to the child's own unique characteristics would produce an award based on sheer speculation.

II. Allowing a multi-million dollar increase in liability for infant death cases would jeopardize the availability of care for Michigan's high-risk pregnancies.

As set forth in greater detail in the brief filed by *amicus curiae* MDTC, infant death cases have historically been resolved for the amount of the higher or lower noneconomic damages cap, plus any medical expenses. Until *Denney*, this was $1-2 million. Post-*Denney*, demands for recovery of future lost earning capacity have single-handedly inflated the value of cases to $10-20 million, depending on the race and sex of the decedent. Nothing has changed in the law except the impression that *Denney* allows recovery of lost earning capacity damages that are not limited to a proven loss of financial support (which, for an infant decedent, would be zero).

For healthcare systems like U-M which offer a robust maternal-fetal medicine service for high-risk pregnancies, that exponential increase in potential liability threatens the availability of that service. Maternal-fetal medicine, or MFM, is a subspecialty of Obstetrics and Gynecology. Mothers with high-risk pregnancies (based on either maternal or fetal risk factors) are frequently referred by their obstetricians to MFM specialists for management of their pregnancies and deliveries. MFM specialists at U-M's Von Voigtlander Women's Hospital (including two of the *Zehel* defendant physicians) manage a wide range of high-risk pregnancy conditions, including maternal cardiac disease, fetal abnormalities and genetic conditions, complex multiple births, fetal growth restriction, preterm labor, addiction disorders, diabetes, obesity, seizures, cancer, and placenta disorders.[6] Working together with pediatric surgeons and neonatal specialists, they also facilitate *in utero* fetal interventions, including meningomyelocele (spina bifida) repair, interventions for complex multiple gestations, intrauterine transfusions, cardiac interventions, and

[6] U-M Von Voigtlander Women's Hospital, "High-Risk Pregnancy," https://www.umwomenshealth.org/conditions-treatments/high-risk-pregnancy (accessed March 21, 2024).

other procedures necessary to save the lives of babies.[7] Without these specialized services, mothers in high-risk pregnancies and their babies would have a far lower chance of making it to a successful delivery and achieving a normal life.

Even with the best of care, however, the high-risk nature of these pregnancies mean that MFM patients are more likely to experience a fetal or post-partum death, as compared with a typical, low-risk pregnancy managed by an obstetrician. The liability exposure for MFM specialists versus regular OB/GYNs reflects this risk. A 2006 study of Massachusetts physicians found that the average liability payment for an MFM specialist was $1.95 million, versus $447,983 for a regular OB/GYN.[8] A 2005 survey of MFM doctors and general OB/GYNs found that 79.5% of MFM doctors have had a claim filed against them, and that 29.6% of those claims went to trial, as compared with 8.6% of claims against OB/GYNs.[9] Of the claims tried, defense verdicts were less likely for MFM doctors than OB/GYNs.[10]

In Michigan, a 2007 survey reflected that 35.5%, 24.5%, and 12.6% of OB/GYNs, family physicians, and nurse-midwives, respectively, planned to reduce their provision of high-risk obstetric care, citing the risk of malpractice litigation.[11] This suggests that even more Michigan mothers with high-risk pregnancies are depending on MFM specialists to manage their care and provide a safe delivery of their babies. It also indicates that the liability risk associated with

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[7] Id.

[8] Barbieri, RI, "Professional Liability Payments in Obstetrics and Gynecology," *Obstetrics & Gynecology* 2006 Mar; 107(3): 578-81, abstract reprinted in *Obstetric Anesthesia Digest* 2006 Sept; 26(3): 122 (**Exhibit B**).

[9] A. Cohen, et al., "Professional Liability Claims and Maternal Fetal Medicine Specialists: MFM Compared to General Obstetrician Gynecologists," *Am J of Obstet Gynecol* 2005 Dec; 193(6), S13 (**Exhibit C**).

[10] Id.

[11] Xu X, Siefert KA, Jacobson PD, et al., "The effects of medical liability on obstetric care supply in Michigan," *Am J Obstet Gynecol* 2008; 198:205.e1-205.e9 (**Exhibit D**).

managing high-risk pregnancies has an adverse effect on the number of doctors willing to provide such care.

If this Court decides to permit verdicts for tens of millions of dollars in infant death cases, there will likely be a corresponding reduction in the amount of providers willing to take on high-risk pregnancies that are more likely to result in an infant death. Because racial minorities experience higher rates of pregnancy-related complications and death for both mothers and infants, a decrease in the availability of MFM care will have a disproportionate effect on the survival rates of minority mothers and children who may not be able to access the specialty care they need to survive.[12] U-M urges this Court to protect access to this vitally important care by rejecting Plaintiff's calls to inflate verdicts and settlements in infant death cases beyond the damages intended by the Legislature.

[12] Kaiser Family Foundation, "Racial Disparities in Maternal and Infant Health: Current Status and Efforts to Address Them," https://www.kff.org/racial-equity-and-health-policy/issue-brief/racial-disparities-in-maternal-and-infant-health-current-status-and-efforts-to-address-them/ (accessed March 21, 2024).

RELIEF REQUESTED

WHEREFORE, for the above-stated reasons and the reasons expressed in the briefs of Prime Healthcare and the other *amici curiae*, *Amicus Curiae* University of Michigan encourages this Court to reaffirm its opinion in *Baker v Slack*, 319 Mich 703; 30 NW2d 403 (1948), and reverse the Court of Appeals opinions in *Zehel v Nugent*, 344 Mich App 490; 1 NW3d 387 (2022), *Daher v Prime Healthcare*, 344 Mich App 522; 1 NW3d 405 (2022), and *Denney v Kent Co Rd Comm'n*, 317 Mich App 727; 896 NW2d 808 (2016). Alternatively, if this Court decides to not reaffirm its opinion in *Baker*, University of Michigan encourages this Court to affirm its decisions in *Zehel* and *Daher*, with respect to the proper measure of lost earning capacity damages in childhood death cases.

Respectfully submitted,

TANOURY, NAUTS, McKINNEY
& DWAIHY, PLLC

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DATED: March 22, 2024

Word Count: 6,472

STATE OF MICHIGAN
IN THE SUPREME COURT

NAWAL DAHER and MOHAMAD JOMAA, as Co-Personal Representatives of the Estate of JAWAD JUMAA a/k/a JAWAD JOMAA, Deceased

Plaintiffs-Appellees,

v

PRIME HEALTHCARE SERVICES-GARDEN CITY, LLC d/b/a GARDEN CITY HOSPITAL, a foreign limited liability company, KELLY W. WELSH, D.O., and MEGAN SHADY, D.O., jointly and severally,

Defendants-Appellants.

Supreme Court No. 165377

Court of Appeals No. 358209

Wayne County Circuit Court
Case No. 2020-004169-NH

INDEX TO EXHIBITS FOR *AMICUS CURIAE* BRIEF ON BEHALF OF UNIVERSITY OF MICHIGAN

EXHIBIT	DESCRIPTION	DATE
A	Excerpts from deposition of Eros Vasquez in *Zehel v Nugent*	02/19/2020
B	Barbieri, RI, "Professional Liability Payments in Obstetrics and Gynecology," *Obstetrics & Gynecology* 2006 Mar; 107(3): 578-81, abstract reprinted in *Obstetric Anesthesia Digest* 2006 Sept; 26(3): 122	September 2006
C	A. Cohen, et al., "Professional Liability Claims and Maternal Fetal Medicine Specialists: MFM Compared to General Obstetrician Gynecologists," *Am J of Obstet Gynecol* 2005 Dec; 193(6), S13	December 2005
D	Xu X, Siefert KA, Jacobson PD, et al., "The effects of medical liability on obstetric care supply in Michigan," *Am J Obstet Gynecol* 2008 Feb; 198:205.e1-205.e9	February 2008

EXHIBIT A

STATE OF MICHIGAN
IN THE CIRCUIT COURT FOR THE COUNTY OF WASHTENAW

BETHANY ZEHEL, Individually
and Personal Representative of
the Estate of Rowyn Vasquez,
Deceased,
Plaintiff,
vs. Case No. 2019-388-NH
Judge Carol Kuhnke
VON VOIGTLANDER, WOMEN'S HOSPITAL*
MICHIGAN MEDICINE*, CLARK
NUGENT, M.D., DEBORAH BERMAN,
M.D., JUSTIN JUNN, M.D., ALICE
MAY CHI, M.D., ANGELA KELLEY,
M.D., NATALIE SAUNDERS, M.D.,
Defendants.
_____/

The Videotaped Deposition of EROS VASQUEZ,
Taken at 645 Griswold Street, Suite 4200,
Detroit, Michigan,
Commencing at 10:03 a.m.,
Wednesday, February 19, 2020,
Before Tammy K. Nannini, CSR/CER-5899.

APPEARANCES

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ALSO PRESENT:
John Orr - Video Technician.

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Detroit, Michigan
Wednesday, February 19, 2020
10:03 a.m.

VIDEO TECHNICIAN: We are now on the record. This is the video-recorded deposition of Eros Vasquez being taken on Wednesday, February 19th, 2020, at 10:03 a.m. We are located at 645 Griswold Street, Suite 4200, in Detroit, Michigan.

We are here in the matter of Bethany Zehel versus Clark Nugent, M.D., et al. This is the case number 2019-388-NH in the State of Michigan Circuit Court for Washtenaw County.

My name is John Orr, video technician.

Would the court reporter please swear in the witness?

EROS VASQUEZ,
was thereupon called as a witness herein, and after having first been duly sworn to testify to the truth, the whole truth and nothing but the truth, was examined and testified as follows:

VIDEO TECHNICIAN: And will the attorneys briefly identify themselves for the record, please?

MR. KAY: Andrew Kay on behalf of the Plaintiffs.

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or L-Y-N, sorry, Vasquez.
Q. And how old is Oaklyn?
A. She is two.
Q. And how old is Ryker?
A. He will be six in April.
Q. Does Ryker go to school?
A. Yes, ma'am.
Q. What school does he go to?
A. Edgemont.
Q. Is that a public school or --
A. Yes, ma'am.
Q. He's in first grade or kindergarten?
A. Kindergarten.
Q. How's he doing in school?
A. Um, he's struggling. He's got a -- some learning disabilities.
Q. Has he been diagnosed with anything, as far as you know, any learning disabilities?
A. Um, so we have gone to a neurologist. We got an opinion in the beginning. They said that --
Q. What do you mean "in the beginning"?
A. Uh, well, he -- he gets these like tremors where his nervous system -- he kind of like flails his arms. He'll look out, kind of space out for, you know, momentarily.

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Q. Where is the neurologist, what hospital?
A. Oh, I don't recall the hospital. It's off of Canton Center and Cherry Hill.
Q. Okay.
A. And I don't remember the name of the practice there.
Q. And how long ago was that?
A. Oh, man. Um, three years ago.
Q. Okay. And you went for the tremors you said?
A. Yeah.
Q. Okay. And has he been treated, then, for the tremors?
A. No, ma'am.
Q. What did the doctor say about the tremors?
A. They should pass; it is a tick is what they registered them as simply because -- they really didn't look at him. It was an eye test kind of. Um, the thing was that he was able to acknowledge people, right, and it wasn't necessarily objects. I guess those on the spectrum tend not to respond to people, and so that's what kind of like okay.
Q. And Ryker is able to respond to people?
A. Uh, yes.
Q. Okay.
A. Yeah.
Q. With eye contact, verbal contact?
A. And that was the other thing, yes, correct.

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Q. He has not been diagnosed with autism?
A. From his opinion, no.
Q. From this neurologist?
A. Not from that one, yeah.
Q. Okay. From anyone else?
A. That's the thing. Unfortunately, other non-medical professionals have asked us to consistently seek more advice.
Q. Who were they?
A. Teachers that he's been with. They seem to think that he is definitely on the spectrum because they've -- with their amount of experience with kids, I suppose.
Q. What symptoms is he having where they -- they're saying he's having that is consistent with spectrum --
A. Um.
Q. -- autism spectrum?
A. The same, what we refer to as his tick.
Q. Uh-huh.
A. The flailing of his arms, right. His jaw kind of like shifts to the side. His eyes, he looks off into space for a brief moment. It's as if he's not really present.
Q. How often does he have these ticks?
A. Consistently. Shoot. Um, if you leave him there by

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himself, it will happen. Um, it depends on if he's occupied, if -- you know, if he's not occupied. I guarantee you if you leave him alone, you look over, you're wondering why it's quiet, that's what he's doing.
Q. So daily? It's happening daily?
A. Oh, hourly.
Q. Hourly?
A. Yeah.
Q. Have you or your wife taken him to any other medical professional for those ticks?
A. Uh, negative.
Q. What about the pediatrician?
A. Um, I don't think we've asked that. I think the -- the same response has occurred, um, quote, unquote, "he will grow out of it."
Q. So, as far as you know, no medical professional has provided you with a medical diagnosis for his behaviors?
A. No.
Q. They made it seem like it's more of a behavioral thing?
A. Um, the pediatricians?
Q. The pediatrician and neurologist.
A. Um, the neurologist simply said it was a habit that

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will change. Pediatricians, I don't think I -- we've received any tangible inform -- I don't think they're qualified to fill us in on what is wrong with his brain or nervous system, and they've admitted that. Um, we just have not gotten to see anyone else.
Q. Do you have plans to?
A. Um, I think we should. You know, I -- I want to say, you know, Bethany and I have kind of been avoiding it. But, obviously, it's hindering his learning ability and his, you know, ability to sit there and focus because it -- it might even happen when he gets frustrated, you know.
Q. Does he have an IEP or a 504?
A. I don't know what those forms are.
Q. Something through the school system. You said he had a learning disability.
A. Okay.
Q. So if he was diagnosed with a learning disability, I'm wondering if there was an IEP or a 504 --
A. Um.
Q. -- established for him in school?
A. No, I don't know if he has any of those. Um, I do know they do have another team of teachers that spend time with individuals that are kind of lagging behind, and he is one of those individuals.

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Q. Did you not know if he's in special education?
A. I don't believe so.
Q. Okay. And you don't believe he's been evaluated by their special education program?
A. No, ma'am.
Q. Okay. Any other doctors that he's seen regarding his ticks or tremors?
A. Not that I can recall.
Q. Okay. And how's Oaklyn doing?
A. Phenomenal.
Q. Do you work during the day or at night?
A. Um, good question. Both.
Q. Who takes care of your kids while you and your wife are working?
A. So her parents, mother and father.
Q. You have been with Bethany since 2012 you said?
A. Yes, ma'am.
Q. And you just got married last September.
Is there a reason why September 9th, 2019?
A. Timing was right and I can't possibly forget that one. If I do, I'm in trouble.
Q. Timing was right and what?
What was the other reason?
A. If I can't remember that date, then I'm in trouble.
Q. No, no, I'm just saying why -- I don't mean like what

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took you so long, but was there a reason why seven years you were together?
A. The timing was right.
Q. Okay.
A. I thought you were asking about the date --
Q. No.
A. -- specifically.
Q. Just wondering at that point in time.
Just the timing was right?
A. Yes, ma'am.
Q. Okay. Was the pregnancy with Rowyn and Ryker planned?
A. No, ma'am.
Q. Okay. Do you know if they were fraternal or identical twins -- or they --
A. Fraternal.
Q. They're fraternal, boy and girl.
A. They're fraternal.
Q. Sorry.
A. That's okay.
Q. Did you attend any prenatal visits with Bethany while she lived in Texas?
A. Yes, ma'am.
Q. Okay. Do you remember the doctor's name?
A. No, ma'am.
Q. How many visits did you attend?

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A. Um, as far as I know, all of them.
Q. Do you remember how many there were?
A. I do not.
Q. Were -- would you be able to distinguish one visit from the next visit?
A. Shoot. After the first one, no. But I just remember her jumping out of her chair after that first scan.
Q. When she found out she was --
A. Yeah.
Q. -- having twins?
A. We had no idea. No idea.
Q. No recollection about the other visits?
Anything that stands out that you remember?
A. No, ma'am.
Q. As far as you know, how was the pregnancy going while -- this is just while you were in Texas.
A. Yeah. Fine.
Q. Any complications that you were made aware of during the pregnancy?
A. No, ma'am.
Q. Did you go into the actual room with Bethany during the visits or did you sit in the -- in the waiting room?
A. Sat right next to her.
Q. Okay. No issues at all that you can recall during the

EXHIBIT B

a live birth. Results were analyzed by age, race, education, marital status, and cause of death.

During the study period, 4992 pregnancy-related deaths were noted; 4.2% were women with multifetal pregnancies (209 deaths). The calculated mortality ratios were 20.8 deaths/100,000 multifetal pregnancies compared with 5.8 deaths/100,000 singleton pregnancies. The singleton pregnancy mortality ratio increased from 3/100,000 to 9/100,000 during the study period. Mortality ratios for multifetal pregnancies fluctuated but also increased and ranged from 11 to 36 deaths/100,000 pregnancies. The authors noted the rise in death rate primarily reflected better reporting of maternal deaths in the later years of the study. Causes of death in the two groups were similar: embolism, hemorrhage, hypertensive disorders of pregnancy, and infection. Women with multifetal pregnancies were 3 to 4 times as likely to die from these causes as were those with singleton gestations. The risk of death was higher for older women regardless of the plurality of the gestation. For women with singleton or multifetal pregnancies, the risk ratios for each age, race, education, and marital status were similar during the study periods. However, the risk of pregnancy-related death was greater among women with multifetal pregnancies, compared with singleton pregnancies at every level of education. It was also greater for married and unmarried women with multifetal pregnancies than for women with singleton pregnancies.

These results point to the significantly increased risk of death for women with multifetal pregnancies, regardless of maternal age, race, marital status, or level of education. Further research into the specific factors contributing to this increased risk is clearly needed.

■ Professional Liability Payments in Obstetrics and Gynecology

Barbieri RL. *Department of Obstetrics and Gynecology, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts.* Obstetrics & Gynecology 2006 May; 107(5): 978–81

Professional liability is a major issue in the medical field. There is some thought that subspecialists in gynecologic oncology, maternal-fetal medicine, and reproductive endocrinology and infertility do not make payments on professional liability claims at the rate that general obstetrician-gynecologists do. This study tested this hypothesis using professional liability payment data from the Massachusetts Board of Registration in Medicine.

This Board administers the initial licensing of physicians and requires renewal every 2 years, at which time physicians must report their professional liability claims and payment history. Into one data set, the Board collects information from the courts, insurance carriers, hospitals, and other health care facilities. Dollar amounts of payments are not included but just that payments were above average, average, or below average. Another data set provides a summary of total payments made within each specialty and subspecialty.

Within specialties, the respective numbers of active practitioners in August 2005 in OB/Gyn, gynecology only, gynecologic oncology, maternal-fetal medicine, and reproductive endocrinology and infertility were 1063, 143, 30, 27, and 34; the respective numbers of physicians making a professional liability payment in the last 10 yr (percentage in parentheses) were 410 (38.5%), 46 (32.2%), 3 (10%), 1 (3.7%), and 4 (11.8%), respectively. The numbers of paid claims for the specialties were 476, 64, 7, 2, and 5, respectively. The total aggregate payment from 1994 to 2003 was $251,542,014. Average payments for the five groups were $447,983, $400,338, $1,014,006, $1,950,000, and $335,500, respectively, with the average total $454,047. Because the payment for each claim was not listed, only average payments for each subspecialty can be reported and statistical testing cannot be performed.

All physicians within the OB/Gyn field have substantial and significant liability risks. With the liability issue growing, the problem can be improved only by combined approaches that involve tort reform and clinical changes to reduce risk.

MECHANISMS, EQUIPMENT, HAZARDS

■ Risk Factors for Brachial Plexus Injury with and without Shoulder Dystocia

Gurewitsch ED, Johnson E, Massenzadeh S, Allen RH. *Department of Gynecology and Obstetrics, Johns Hopkins University, Baltimore, Maryland.* American Journal of Obstetrics and Gynecology 2006 Feb; 194(2): 486–92

Permanent brachial plexus palsy (BPP) can occur in utero, but the mechanism is controversial. BPP injury has been thought to occur primarily during shoulder dystocia (SD). The diagnosis of BPP without SD has usually been considered as a failure to recognize that shoulder dystocia was present. Whether this is the actual case or whether BPP without SD is a natural phenomenon with a different mechanism of injury was investigated by comparing risk factors and outcomes of BPP associated with SD (BPP-SD) and without SD (non-SD-BPP).

A retrospective cohort of infants with birth-associated BPP was obtained from all deliveries at Johns Hopkins Hospital (JHH) from June 1993 to December 2004 and from a data set of litigated permanent obstetric BPP from multiple U.S. institutions (date of birth 1986–2003). Only BPPs associated with singleton cephalic vaginal deliveries were included. Temporary BPP was that which resolved within 2 yr. Damage among permanent BPP cases was determined by findings at the time of brachial plexus exploration, results of EMG or nerve conduction studies, or neurologic examination. Severity scores were labeled

EXHIBIT C

27 MATERNAL AND NEONATAL POLYMORPHISM OF THE CD95 GENE IN PREGNANCIES COMPLICATED BY HELLP SYNDROME

ISTVAN SZILLER[1], PETRONELLA HUPUCZI[1], NEIL NORMAND[2], AMRITA HALMOS[3], ZOLTAN PAPP[3], STEVEN WITKIN[2], [1]Semmelweis University of Medicine, 1st Department of Obstetrics and Gynecology, Budapest, Hungary, [2]Cornell University Medical College, Obstetrics and Gynecology, New York, New York, [3]Semmelweis University, 1st Department of Obstetrics and Gynecology, Budapest, Hungary

OBJECTIVE: There is increasing evidence that preeclampsia with or without HELLP syndrome is the result of a breakdown in maternal tolerance to the fetal semi-allograft. Fas (CD95) – Fas ligand interactions have been implicated in the regulation and maintenance of graft tolerance. This study was aimed to determine whether a single nucleotide polymorphism in the gene coding for Fas (gene symbol TNFRSF6) in the mother or her fetus is associated with the hemolysis, elevated liver enzymes, low platelets (HELLP) syndrome.

STUDY DESIGN: In a retrospective study, buccal swabs from 81 pregnant women with the complete form of HELLP syndrome and 83 normotensive control women with uncomplicated full term pregnancy were analyzed for a single nucleotide A>G TNFRSF6 polymorphism at position -670. Investigators were blinded to clinical outcomes.

RESULTS: Homozygous maternal TNFRSF6-670*A carriage was detected in 37.3% of normotensive pregnant women as opposed to 16.1% of HELLP syndrome patients ($p = 0.002$). In contrast, maternal homozygosity for TNFRSF6-670*G was higher (33.3%) in HELLP patients compared to normotensive controls (19.3%) ($p = 0.04$). While homozygous carriage of TNFRSF6*G genotype was not more frequent among neonates born to mothers with HELLP syndrome compared to those born to control pregnant women, the frequency of paired mother-infant genotypes in which both mother and fetus were homozygous for the TNFRSF6*G allele was higher in cases of HELLP syndrome (28.6%) compared to those of normotensive pregnancies (12%) ($p = 0.03$). In patients with HELLP syndrome, no association between TNFRSF6 genotype and platelet counts or liver enzymes levels were noted.

CONCLUSION: The TNFRSF6-670*G polymorphism is associated with a decrease in lymphocyte apoptosis. A prolonged capacity of maternal lymphocytes to destroy trophoblast cells, resulting in decreased trophoblast invasion into decidua, would increase the risk for HELLP syndrome.

Supported by NIH 41676.

28 ROLE OF SFLT-1 IN HYPERTENSION OF PREGNANCY

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OBJECTIVE: It has been shown that the level of soluble fms-like tyrosine kinase1 (sFlt-1) is elevated in gravidas destined to develop preeclampsia, and a role for sFlt-1 in its pathogenesis has been suggested. Our objective was to test the pathogenesis hypothesis, and establish a mouse model of hypertension during pregnancy induced by sFlt-1 generated by transfection with an adenovirus vector.

STUDY DESIGN: At day 8 of gestation, CD-1 mice ($n=11$) were randomly allocated to injection of an adenovirus carrying sFlt-1 [AdFlt(1-3); 10^9PFU] or saline. At day 10 of gestation, blood pressure (BP) catheters were inserted through the left carotid artery into the aortic arch and tunneled to a telemetric transmitter. BP was monitored telemetrically and continuously in the conscious unrestrained animals until day 18. Blood was collected from the pregnant mice at different gestational times and plasma sFlt-1 was measured by ELISA. Pups and placentae were weighed at sacrifice on day 18. Student's t-test and Pearson correlation were used for statistical analysis (significance: $p<0.05$).

RESULTS: The mean BP in AdFlt-treated mice was significantly higher on days 17 and 18 of gestation (124.70 ± 8.48 and 125 ± 9.57 mmHg, respectively) compared with the control group (93.22 ± 2.82 and 91.63 ± 6.11 mmHg, respectively). On days 17 and 18, the plasma levels of sFlt-1 in AdFlt-treated mice were significantly higher than control (21.68 ± 0.26 vs. 0.58 ± 0.075 ng/ml). The time-course of BP rise mirrored that of sFlt-1, and BP correlated with sFlt-1 levels (Pearson correlation $r=0.884$). The average pup weight (1.03 ± 0.006g vs 1.31 ± 0.07g) and placental weight (0.11 ± 0.007g vs 0.22 ± 0.03g) were significantly lower in the AdFlt-treated mice compared with control.

CONCLUSION: sFlt-1 induces hypertension and fetal growth restriction in pregnant mice, supporting its hypothesized role in the pathogenesis of preeclampsia. Unlike other animal models, ours more closely resembles the clinical situation and minimizes the need for manipulation or administration of various compounds to induce the condition.

29 FIRST TRIMESTER TROPHOBLAST EXPOSED TO THE SERA OF WOMEN WITH PREECLAMPSIA HAVE INCREASED SECRETION OF TISSUE FACTOR

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OBJECTIVE: Preeclampsia is characterized by damage to the maternal endothelium. It has been postulated that this damage is mediated by increased shedding of placental microparticles into the maternal circulation although the mechanism of this process has not be described. We previously reported that first trimester trophoblast secrete Fas Ligand via microvesicles and we report this year that first trimester trophoblast also secrete Tissue Factor via microvesicles. The aim of this study was to determine whether there is differential secretion of Tissue Factor from first trimester trophoblast cells when exposed to sera of women with preeclampsia.

STUDY DESIGN: First trimester trophoblast cells were cultured and grown to 80% confluency under 3 conditions: no treatment, 10% serum from normotensive women, and 10% serum from preeclamptic women. The supernatants from the cell cultures were collected and microvesicles were isolated using an ultracentrifugation technique. Tissue Factor was determined by ELISA.

RESULTS: A statistical significant increase of TF was identified in microvesicles isolated from first trimester trophoblast exposed to sera of preeclamptic patients (2037 pg/nl) compared to cells treated with sera of normotensive women (1319 pg/nl) or control cells treated with FBS (1623 pg/nl).

CONCLUSION: The findings in this study suggest that a potential mechanism by which increased shedding of placental microvesicles mediates damage to the maternal endothelium in preeclampsia is via Tissue Factor. While TF in normal conditions may serve as a mechanism whereby the invading blastocyst is able to implant without causing hemorrhage at the implantation site, increased levels of TF, as seen in the microvesicles isolated from trophoblast exposed to preeclamptic sera, may actually cause pathologic thrombosis at the implantation site, leading to poor placentation and further damage to the maternal endothelium.

30 PROFESSIONAL LIABILITY CLAIMS AND MATERNAL FETAL MEDICINE SPECIALISTS: MFM COMPARED TO GENERAL OBSTETRICIAN GYNECOLOGISTS

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OBJECTIVE: The purpose of this study was to survey Maternal Fetal Medicine (MFM) specialists about professional liability claims and compare that to a similar survey by ACOG for general Ob/Gyns.

STUDY DESIGN: The ACOG Professional Liability survey tool was modified to obtain information about professional liability relating to MFMs. The membership of SMFM was invited to participate through emails to the entire membership.

RESULTS: Of the 1300 active members of SMFM, 645(49.6%) responded to the survey. 79.5% of all respondents had had at least one claim filed against them. The mean number of claims for each member was 3.94. Twenty-nine percent of all claims have gone to trial and 69% were defense verdict. All of these outcomes are significantly different than what was found when general Ob/Gyns were surveyed by ACOG. The most common allegation against MFMs was neurologically impaired infant followed by Failure to diagnose.

CONCLUSION: We found that professional liability claims are more common and defense verdicts are less common among MFMs than general Ob/Gyns. This has significant effect upon our specialty.

MFM compared to Ob/Gyn

	MFM	Ob/Gyn
% Membership	49.6%	45.5%
Ever had a claim	79.5%	76%
Mean number of claims	3.94	2.6*
% going to trial	29%	8.6%*
Defense verdict	69.8%	81.3%*

Allegations

	MFM	Ob/Gyn
Neurologically impaired infant	25.4%	34.5%*
IUFD	7.8%	15%*
Infant injury	9.2%	7%
Failure to diagnose	14.5%	7%*

* $p<0.05$

EXHIBIT D

OBSTETRICS

The effects of medical liability on obstetric care supply in Michigan

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OBJECTIVE: The objective of the study was to examine Michigan obstetric providers' provision of obstetric care and the impact of malpractice concerns on their practice decisions.

STUDY DESIGN: Data were obtained from 899 Michigan obstetrician-gynecologists, family physicians, and nurse-midwives via a statewide survey. Statistical tests were conducted to examine differences in obstetric care provision and the influence of various factors across specialties.

RESULTS: Among providers currently practicing obstetrics, 18.3%, 18.7%, and 11.9% of obstetrician-gynecologists, family physicians, and nurse-midwives, respectively, planned to discontinue delivering babies in the next 5 years, and 35.5%, 24.5%, and 12.6%, respectively, planned to reduce their provision of high-risk obstetric care. "Risk of malpractice litigation" was 1 of the most cited factors affecting providers' decision to include obstetrics in their practice.

CONCLUSION: Litigation risk appears to be an important factor influencing Michigan obstetric providers' decisions about provision of care. Its implications for obstetric care supply and patients' access to care warrants further research.

Key words: family physician, medical liability, nurse-midwives, obstetric care, obstetrician-gynecologist

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Increasing malpractice litigation risk and medical liability insurance premiums have caused widespread concern regarding their effects on obstetric care.[1] Although prior research has attempted to examine the influence of medical liability issues on obstetric practice, it remains unclear how medical liability concerns compare with other factors in affecting providers' decision to provide or discontinue obstetric services. Moreover, few studies have assessed these issues across all 3 major groups of obstetrical providers: obstetrician-gynecologists (ob-gyns), family physicians, and nurse-midwives. Factors affecting their decisions surrounding obstetric practice may well be different.

Michigan is classified by the American Medical Association (AMA) as a state showing signs of looming medical liability crisis.[2] Liability insurance premiums for ob-gyns in Michigan have been reported as among the highest in the country for years.[3] Although the numbers specifically for obstetric care are not available, the overall payments on malpractice claims in Michigan reached nearly 60 million in 2005 for a total of 451 paid malpractice claims.[4,5] The costly medical liability climate[6] may have considerable impact on obstetrical care supply in Michigan and put patient access to care at risk. Nevertheless, there is a dearth of objective data to help assess this issue.

The purpose of this study is 2-fold. First, we evaluated the supply of obstetrical care in Michigan by characterizing providers' current provision of obstetric services and their plans for future practice. Second, we examined the relative importance of a wide range of factors, including concerns about liability litigation risk and availability and affordability of liability insurance, potentially affecting providers' practice decision (whether to include obstetrics in practice and where to practice). Findings from this study will help illuminate the influence of Michigan's current liability environment on its obstetrical care, inform the current discussion surrounding medical liability reform, and help maintain patient access and patient safety associated with obstetric care.

Materials and Methods

Survey

A statewide survey of obstetrical providers, including ob-gyns, family/general medicine physicians (hereinafter referred to as family physicians), and nurse-midwives,

From the Department of Obstetrics and Gynecology (Dr Xu), the School of Social Work (Dr Siefert), the Department of Health Management and Policy, School of Public Health (Dr Jacobson), and the School of Nursing (Ms Lori), University of Michigan, Ann Arbor, MI, and the Health Science Center, University of North Texas, Fort Worth, TX (Dr Ransom).

Findings from this study were presented at the 134th annual meeting of the American Public Health Association, Boston, MA, Nov. 4-8, 2006.

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was conducted for this study. We used the AMA Physician Masterfile as our sampling frame to draw a random sample of 2000 physicians (800 ob-gyns and 1200 family physicians) aged 70 years or younger with mailing addresses in Michigan. To ensure that the sample had an adequate number of physicians with key characteristics (eg, providing obstetric services, practicing in rural areas), we oversampled ob-gyns, non–office-based physicians (eg, hospital employed, residents/fellows), and physicians whose addresses were in nonmetropolitan counties. In the meantime, we obtained a mailing list of Michigan certified nurse-midwives (CNMs) (n = 272) from the American College of Nurse-Midwives (ACNM) along with contact information for senior nurse-midwifery students (n = 10) enrolled in the nurse-midwifery program at the University of Michigan. All were included in the survey.

A self-administered questionnaire was developed by the investigators, drawing on previous work in this field.[7-14] Several questions were taken or adapted from previously validated survey items.[7,15] A preliminary version of the survey instrument was pilot tested among a small group of obstetrical providers (including ob-gyns, family physicians, and CNMs) from the investigators' institution, local community hospitals, and private practices. Survey questions were deleted, added, or modified in response to comments received during this pilot testing. The final instrument contained items ascertaining information on providers' obstetric practice, medical liability insurance coverage, malpractice litigation experience, career satisfaction, career plan, and factors influencing their decisions regarding practice location and whether to include obstetrics in their practice. The survey instrument and procedure were approved by the University of Michigan Medical School Institutional Review Board.

The questionnaire was distributed to the 2000 physicians and 282 nurse-midwives in February 2006. Initial contact was made through e-mail for providers with e-mail addresses available and by mail for all other providers. All providers were offered a choice to respond by mail, fax, or on-line. No incentives were provided for completing the survey, but to help inform potential respondents of the study and improve the response rate, the Wayne County Medical Society of Southeast Michigan and the Southeastern Michigan ACNM Chapter posted information about the study on their website and/or monthly newsletter. A reminder and 2 follow-up contacts were also made to increase the response rate. The entire survey was completed in August 2006.

Of the 2282 surveys sent out, 107 were undeliverable (incorrect address or provider no longer working at the address) and 3 were returned because the providers were deceased. The final response rates varied across specialties: 76.9% among nurse-midwives, 48.2% among ob-gyns, and 41.3% among family physicians.

Outcome measures

Our primary outcome measures were provision of obstetric services and provider perceived importance of factors affecting practice decisions. With regard to obstetric service, this study focused on each provider's current practice and plans for future practice. For providers who were currently in residency, fellowship, or midwifery programs, we asked about their anticipated future practice plans upon completing their training program, including the likelihood of remaining in Michigan, the likelihood of including obstetric services in their practice, and the type of obstetric services they would provide.

To identify important issues affecting providers' decision about whether to include obstetrics in their practice, a list of 14 potential factors, synthesized from previous research, was presented. Examples include "compatibility with my lifestyle/family life," "adequacy of remuneration/financial incentive," "risk of malpractice litigation," "my interest in obstetrics," and "adequacy of my training in obstetrics." An "other (please specify)" item was also included to record any provider specified factors. Respondents were asked to rate the importance of each factor from "no impact" to "high impact." In a similar manner, 6 factors, with an additional "other (please specify)" item, were presented to respondents to assess their influence on providers' choice of practice location. Providers were also instructed to specify the 3 most important factors (from the list) influencing their decisions regarding obstetric practice and practice location, respectively. A complete list of these factors is reported in Appendix 1.

Statistical analysis

Because a stratified random sampling method was used when drawing the physician sample, each physician had a different probability of being included in the survey. Weights were calculated to adjust for these sampling effects. We further used the demographic and practice characteristics recorded in the AMA Physician Masterfile, including age, sex, medical degree (MD vs DO), specialty (family/general medicine vs obstetrics/gynecology), office-based practice (vs other practice), and mailing address within metropolitan counties (vs nonmetropolitan counties), to assess differences between respondents and nonrespondents. Weights were further adjusted to account for nonresponse bias. Because all nurse-midwives were surveyed, weights were constructed solely to adjust for nonresponse bias. After applying the weights, distribution of the characteristics of survey respondents were comparable with the corresponding provider population in Michigan.

For the purpose of this study, we focused on providers who were currently engaged in clinical practice in Michigan (regardless of obstetric service) or in a residency/fellowship/nurse-midwifery training program in Michigan. Surveying residents, fellows, and senior nurse-midwifery students allowed us to assess their future plans about obstetric care upon completing their training program, an important consideration in analyzing obstetric care supply. Of the total respondents, 101 were not currently involved in clinical practice (eg, retirement, full-time administrative position), 29 were not practicing in Michigan, and 17 did not provide sufficient data. This resulted in a final sample of 899 providers for our analysis: 330 ob-gyns, 416 family physicians, and 153 nurse-midwives.

TABLE 1
Respondent characteristics

Characteristics	Obstetrician-gynecologists (n = 330)	Family physicians (n = 416)	Nurse-midwives (n = 153)	*P* value
Age 50 y or older (%)	46.7	46.4	—[a]	.75[b]
Female (%)	48.0	37.7	100.0	< .01[b]
Non-Hispanic white (%)	79.2	80.8	93.4	< .01
Graduated from a medical school/midwifery program in Michigan (%)	53.6	54.9	31.1	< .01
Hours/week spent on direct patient care (%)				< .01
20 or less	5.5	8.8	18.7	
21-40	38.3	54.0	50.0	
More than 40	56.2	37.1	31.3	
Currently in a residency/fellowship/midwifery training program (%)	13.9	10.5	4.6	< .01
Currently practicing obstetrics (%)[c]	82.1	19.7	84.0	< .01
Ever practiced obstetrics (%)[c]	97.1	59.6	96.5	< .01

Respondents with missing data on the variable were not included in the statistics (less than 3.0% for each 1 of the variables). Percentages may not add up to exactly 100% because of rounding.

[a] Age information was not available among nurse-midwifery respondents.

[b] χ^2 tests conducted between obstetrician-gynecologists and family physicians.

[c] Among providers who were not currently in residency/fellowship training or nurse-midwifery programs.

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Descriptive statistics were calculated, by specialty, to determine the characteristics of respondents and their provision of obstetric services. The impact of various factors on obstetric care provision and practice location was summarized by the percentage of respondents rating the factor as having high impact, moderate impact, small impact, and no impact, respectively. Differences across specialties were examined using Rao-Scott χ^2 tests adjusting for complex sample design. In addition, we ranked all the factors reported by respondents as 1 of the 3 most important by frequency of citation and reported the top 3 factors for each specialty. The analyses of the importance of various factors influencing obstetric care provision were conducted both with and without residents, fellows, and nurse-midwifery students. No important differences were observed. Therefore, data analyses based on the entire sample are reported. Weights were routinely used in all analyses. *P* values less than .05 were considered statistically significant. All data analyses were conducted using SAS 9.1 (SAS Institute Inc, Cary, NC).

RESULTS

Characteristics of our study population are summarized in Table 1. The majority of the providers self-identified as non-Hispanic white. About half of the physicians had graduated from a medical school in Michigan, whereas less than a third of nurse-midwives had completed a midwifery program in Michigan. Almost all ob-gyns and nurse-midwives had provided obstetric care at some point in their career, and more than 80% were still practicing obstetrics when surveyed. This compared with 59.6% of family physicians who had ever practiced obstetrics and 19.7% who were currently providing obstetric services. Among family physicians currently practicing obstetrics, 5.5% indicated that they performed cesarean section in their current practice and none reported delivering at home. Among nurse-midwives who currently delivered babies, only 2.8% reported delivering at home. The primary offices of the respondents were located in 72 of Michigan's 83 counties.

Among providers currently practicing obstetrics (Table 2), close to 20% of ob-gyns and family physicians reported that they planned to stop delivering babies in the next 5 years and 11.9% of CNMs planned to do so. Of those who currently saw patients with high-risk pregnancies, 35.5%, 24.5%, and 12.6% of ob-gyns, family physicians, and CNMs, respectively, planned to reduce their high-risk obstetric care in the next 5 years. More ob-gyns (20.0%) reported that they definitely would or very likely would stop obstetric practice over the next 5 years than family physicians or CNMs (14.3% and 11.9%, respectively). Nearly half of ob-gyns (49.7%) who were currently practicing obstetrics expressed an intention to limit the number of Medicaid obstetric patients over the next 5 years.

There were 223 providers (46 ob-gyns, 160 family physicians, and 17 CNMs; unweighted) in the sample who had previously practiced obstetrics but no longer included it in their current practice (data not shown). When asked how

TABLE 2
Planned changes in obstetric care provision among Michigan providers who were currently practicing obstetrics[a]

Planned changes in obstetric practice in next 5 years	Obstetrician-gynecologists (n = 225)	Family physicians (n = 72)	Nurse-midwives (n = 121)	*P* value
Plan to reduce the amount of high-risk obstetrical care provided (%)[b]	35.5	24.5	12.6	< .01
Plan to stop delivering babies (%)[b]	18.3	18.7	11.9	.20
Plan to limit the number of Medicaid obstetric patients (%)[b]	49.7	16.7	9.7	< .01
Plan to stop obstetrical practice (%)				< .01
Definitely will	7.3	2.5	6.8	
Very likely	12.7	11.8	5.1	
Somewhat likely	9.3	6.5	9.4	
Not likely	37.1	54.9	47.9	
Definitely will not	33.6	24.3	30.8	
Plan to move practice outside of Michigan (%)				< .01
Definitely will/very likely	6.1	2.4	4.2	
Somewhat likely	10.9	10.1	12.7	
Not likely	45.9	40.9	30.5	
Definitely will not	37.1	46.7	52.5	

Respondents with missing data on the variable were not included in the statistics (less than 3% for each 1 of the variables). Percentages may not add up to exactly 100% because of rounding.

[a] Not including providers currently in residency/fellowship/nurse-midwifery training programs.

[b] Not including providers who indicated that the question was not applicable (eg, they were not providing high-risk obstetric care to begin with).

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likely they would be to resume obstetric care in the next 5 years, the majority reported they definitely would not or were not likely to do so (90.3%, 93.3%, and 88.2% for ob-gyns, family physicians, and CNMs, respectively; weighted). In addition, of the providers who had never practiced obstetrics (n = 123; unweighted), only 3 (3.1%, weighted) indicated that they were somewhat likely to start obstetrics in the near future.

Compared with residents/fellows in family/general medicine, the proportion reporting they definitely would or very likely would include obstetric care in their practice was more than twice as high among ob-gyn residents/fellows (72.7% vs 32.2%) (Table 3). Among those who reported being at least somewhat likely to practice obstetrics, all ob-gyns said that they would deliver babies and perform cesarean deliveries, compared with 89.1% and 19.6% of family physicians, respectively. Most physicians who were at least somewhat likely to provide obstetric care planned to stay in Michigan for practice upon completing their residency or fellowship programs. To protect the confidentiality of nurse-midwifery students who responded to the survey (n = 7), we did not report data on their planned practice upon graduation.

Table 4 reports respondents' perceived importance of the 4 medical malpractice–related factors that might have influenced their decision whether to include obstetrics in their practice. "Risk of malpractice litigation" was reported by 37.5% and 51.2% of ob-gyns and family physicians, respectively, as having a high impact on their decision. Thirty-seven percent of family physicians also cited "medical liability insurance premiums/difficulty in obtaining liability insurance" as a factor having a high impact on their decision. In contrast, 29.8% and 15.3% of ob-gyns and nurse-midwives, respectively, reported affordability/availability of liability insurance as a high-impact factor. With regard to back-up coverage, 24.8% of family physicians reported it as a high-impact factor, compared with 14.5% and 19.2% of ob-gyns and CNMs, respectively. Few providers specified credentialing barriers as a high-impact factor. Other factors of particular interest include "adequacy of remuneration/financial incentives" and "concern about disruption of other practice," with 24.4%, 15.0%, and 22.5% of ob-gyns, family physicians, and CNMs, respectively, reporting the former as having a high impact on their decision, and 8.6%, 28.3%, and 2.6% rating the latter as a high-impact factor.

When asked to list the 3 most important factors (among the entire list of 14 potential factors) that could have affected their decision, "compatibility with lifestyle/family life," "interest in obstetrics," and "risk of malpractice litigation" were most frequently cited by ob-gyns (48.8%, 45.7%, and 45.5%, respectively) and nurse-midwives (53.6%, 53.6%, and 29.3%, respec-

TABLE 3
Plans for future practice among residents and fellows[a]

Planned future obstetric practice on completing residency/fellowship program	Obstetrician-gynecologists (n = 43)	Family physicians (n = 61)	*P* value
Plan to include obstetric care in practice (%)			< .01
Definitely will	56.0	6.3	
Very likely	16.7	25.9	
Somewhat likely	14.8	17.0	
Not likely	10.6	24.1	
Definitely will not	1.8	26.6	
Types of obstetrical care plan to provide[b]			
High-risk prenatal care (%)	43.5	12.8	< .01
Deliveries (any) (%)	100.0	89.1	—
Cesarean deliveries (%)	100.0	19.6	—
Plan to stay in Michigan for practice (%)[b]			< .01
Definitely will	11.9	35.3	
Very likely	27.0	17.8	
Somewhat likely	23.7	20.9	
Not likely	18.1	8.9	
Definitely will not	19.2	17.1	

Less than 3% of the respondents had missing data for each of the variables. Percentages may not add up to exactly 100% because of rounding.

[a] To protect the confidentiality of nurse-midwifery students (n = 7), data are not reported on their future career plans.

[b] Among providers who reported "definitely," "very likely," or "somewhat likely" to include obstetrics in future practice.

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tively). Among family physicians, the same 3 factors were most frequently reported except that "risk of malpractice litigation" was the second most cited factor (58.2%, 36.3%, and 47.7%, respectively).

Table 5 presents data on respondents' rating of the 2 medical malpractice–related factors possibly affecting their practice location. Nearly 20% of the providers said that "risk of malpractice litigation" and "affordability/availability of medical liability insurance coverage" had a high impact on their decision. When asked about the 3 most important factors influencing their choice of practice location, "personal reasons," "professional opportunities," and "risk of malpractice litigation" were cited by 87.4%, 52.0%, and 42.6% of the ob-gyns, respectively, whereas "personal reasons," "professional opportunities," and "financial remuneration" were most frequently cited by family physicians (91.4%, 61.6%, and 39.8%, respectively) and nurse-midwives (90.1%, 68.1%, and 51.1%, respectively).

Comment

Discontinuation or reduction of obstetric practice by providers significantly affects patient access to care. It may result in suboptimal prenatal care and delay the diagnosis and care of acute perinatal complications.[16] Although Michigan is 1 of the states reported to have high malpractice premiums for obstetricians, there are few objective data with regard to the impact of malpractice concerns on obstetric care. Via a statewide survey, this study provided an opportunity to evaluate the influence of Michigan's medical liability climate on its obstetric care supply, which bears significant implications for patient access to care and quality of care. The study also makes a unique contribution by assessing this issue across all 3 major specialties of obstetrical providers and hence provides a comprehensive view of the circumstances in Michigan.

Although few providers planned to leave Michigan in the next 5 years, we found that approximately 18% of ob-gyns and family physicians intended to stop delivering babies in the next 5 years, and about 30% were considering reducing high-risk obstetric care. In addition, approximately 12% of CNMs planned on similar changes in their practice. Although these percentages are somewhat lower than those found in other studies (eg, a recent survey in Oregon found that 31% of its current delivery providers planned to stop delivering babies in the next 1-5 years[11]), the potential impact on the obstetric care supply in Michigan warrants close attention. Such changes, if they were to happen, could have an impact on access to obstetric care. Given that 254 babies in Michigan are born to mothers without adequate prenatal care during an average week,[17] efforts are needed to assure that patients have adequate access to needed care.

TABLE 4
Impact of medical malpractice–related factors on providers' decision about whether to include obstetrics in practice

Factors	Obstetrician-gynecologists (n = 330)	Family physicians (n = 416)	Nurse-midwives (n = 153)	*P* value[a]
Risk of malpractice litigation (%)				< .01
High impact	37.5	51.2	21.7	
Moderate impact	25.2	19.1	27.6	
Small impact	25.2	14.0	33.6	
No impact	8.0	6.0	11.8	
Not applicable	4.1	9.7	5.3	
Medical liability insurance premiums/difficulty in obtaining liability insurance (%)				< .01
High impact	29.8	36.9	15.3	
Moderate impact	16.9	17.8	10.0	
Small impact	21.9	19.1	21.3	
No impact	22.5	14.7	32.7	
Not applicable	8.9	11.4	20.7	
Difficulty in obtaining back-up coverage (%)				< .01
High impact	14.5	24.8	19.2	
Moderate impact	13.4	16.8	13.2	
Small impact	23.3	19.8	11.9	
No impact	33.5	24.2	30.5	
Not applicable	15.3	14.4	25.2	
Credentialing barriers (%)				<0.01
High impact	3.2	10.4	9.4	
Moderate impact	3.5	12.3	12.1	
Small impact	15.1	25.0	16.8	
No impact	48.8	33.0	37.6	
Not applicable	29.4	19.3	24.2	

Percentages may not add up to exactly 100% because of rounding. Less than 4.5% of the respondents had missing data for each of the variables.

[a] χ^2 tests for differences across specialties were conducted without the "not applicable" category.

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Our data indicate that litigation risk is 1 of the most cited factors by providers (in all 3 specialties) to influence their decision on whether to provide obstetrical care. It is also frequently cited by ob-gyns as a motivation in their choice of practice location. These findings are consistent with prior studies conducted elsewhere in the United States. Smits et al[11] showed that in Oregon, 43% of obstetrical providers (including ob-gyns, family physicians, and CNMs) reported the fear of lawsuits as a major reason for considering stopping deliveries. A national survey of ob-gyn residents also reported that 96% of the respondents were "very concerned" or "somewhat concerned" about malpractice litigation and that 35% of the respondents pursued fellowship or solely gynecology because of malpractice concerns.[18]

Data from the 2006 American College of Obstetricians and Gynecologists survey on professional liability indicated that nationwide 65% of ob-gyn respondents had made some changes to their practice over the previous 3 years for fear of professional liability claims or litigation.[19] Among them, 8% stopped practicing obstetrics altogether and 33% decreased the number of high-risk obstetric patients seen.[19] Results for District V, in which Michigan is situated, showed that almost 9% of ob-gyns had ceased practicing obstetrics and 34% of ob-gyns had reduced the number of high-risk obstetric patients since 2003 because of risks for medical malpractice claims or litigation.[20]

Our study adds to this literature and underscores the importance of litigation risk as an influence on providers' decision about obstetric practice. In

TABLE 5
Factors affecting providers' choice of practice location

Factors	Obstetrician-gynecologists (n = 330)	Family physicians (n = 416)	Nurse-midwives (n = 153)	*P* value[a]
Risk of malpractice litigation (%)				< .01
High impact	20.8	16.8	17.2	
Moderate impact	33.4	22.3	20.5	
Small impact	26.1	29.6	34.4	
No impact	16.1	28.8	25.8	
Not applicable	3.6	2.6	2.0	
Affordability/availability of medical liability insurance coverage (%)				< .01
High impact	20.5	15.7	17.2	
Moderate impact	29.3	21.0	26.5	
Small impact	27.4	29.9	18.5	
No impact	18.3	27.7	28.5	
Not applicable	4.5	5.7	9.3	

Percentages may not add up to exactly 100% because of rounding. Less than 2.8% of the respondents had missing data for each of the variables.

[a] χ^2 tests for differences across specialties were conducted without the "not applicable" category.

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future research, priority should be given to more direct assessment of the association between provider liability burden and women's access to obstetric care and the quality of care they receive. Findings from such studies would help elucidate the ultimate impact of liability issues on patient care.

Another disturbing finding of our study is that nearly half of ob-gyns who were currently practicing obstetrics indicated that they plan to limit the number of Medicaid obstetric patients in the next 5 years. Although the exact reason for such a high proportion was not directly assessable in this study, other research provides some plausible explanations. Anecdotal misperception was found, especially among obstetricians, that Medicaid patients are more likely to sue,[21] even though previous research suggested the opposite.[22,23]

Another contributing factor could be the lower Medicaid reimbursement rate.[24,25] In conjunction with increasing medical malpractice costs (both the premium rates and payment for litigation), ob-gyns may be less willing to accept Medicaid patients, for whom the reimbursement is low. Regardless of the reason, the high proportion of ob-gyns planning to restrict the number of Medicaid obstetric patients, in addition to the fact that many obstetric providers already limit the number of Medicaid patients they accept,[24,26,27] could endanger obstetric care for these medically underserved patients.

Additionally, results from our study suggest that providers' concerns about provision of obstetric care vary across specialties. For instance, 37% of family physicians perceived the level of medical liability insurance premium and difficulty in obtaining liability insurance as having a high impact on their decision of whether to include obstetrics in practice, whereas a relatively lower proportion of ob-gyns and nurse-midwives reported it as a high-impact factor. Such differences underscore the unique challenges faced by providers in different specialties in providing obstetric care and should be considered in developing tailored approaches to retaining the obstetric care supply.

Several limitations of the study should be acknowledged. First, discontinuation or reduction in obstetrical care reflects only 1 aspect of obstetrical care supply, although an important one. Future research should also assess provider relocation issues. If the amount of obstetrical care cut back by some providers can be replenished by others entering the area, patient access may not be affected.[28] However, if there is a net exodus of providers in addition to reductions of service within a certain area, patients will face a much greater barrier to accessing obstetrical care.

As with any survey research, the data collected in this study were subject to nonresponse bias. Our response rate (76.9% among nurse-midwives, 48.2% among ob-gyns, and 41.3% among family physicians) was achieved after making a variety of efforts to encourage response (eg, repeated follow-up with nonrespondents, multiple survey modes, and response modalities). Although it compares favorably with many mail surveys of physicians[29-31] and weights were applied to adjust for any observed nonresponse bias, it is possible that providers with stronger feelings about medical liability issues were more inclined to respond.

Another limitation of this study is that our findings are based on data from a single state and may not generalize to other parts of the country. Fi-

nally, the subanalysis conducted among residents and fellows was based on a relatively small sample size. Future investigations focusing on this subpopulation with a larger sample size could provide more definitive results.

Despite these limitations, this study contributes important new data to help understand the influence of the current malpractice climate on obstetrical care. The findings indicate that a significant proportion of Michigan's ob-gyns, family physicians, and nurse-midwives plan to discontinue delivering babies or reduce high-risk obstetric care in the next 5 years. Malpractice litigation risk appears to be an important factor influencing Michigan obstetric providers' decisions regarding their practice. The implications of this for the supply of obstetrical care providers and patients' access to care are serious and merit further investigation. ■

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APPENDIX 1

Factors examined in the survey

Factors affecting decisions about whether to include obstetrics in current or future practice

Appropriate role model

Compatibility with lifestyle/family life

Risk of malpractice litigation

Interest in obstetrics

Concerns about disruption of other practice

Preference to focus on gynecology or family/general practice

Adequacy of training in obstetrics

Medical liability insurance premiums/difficulty in obtaining liability insurance

Adequacy of facilities in practice

Clinical caseload in the community served

Adequacy of remuneration/financial incentive

Difficulty in obtaining back-up coverage

Change in professional life (eg, change of specialty, entry into hospital practice, retirement, etc)

Credentialing barriers

Factors affecting choice of practice location

Financial renumeration

Risk of malpractice litigation

Personal reason (eg, proximity to family, lifestyle, etc)

Patient population (eg, high-risk pregnancies, etc)

Affordability/availability of medical liability insurance coverage

Professional opportunities