

Rapid Scoping Review of Medical Malpractice Policies in Obstetrics

Final report on findings

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**Knowledge
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Disclaimer

The information in this report is a summary of available material and is designed to give readers (health systems stakeholders, policy and decision makers) a starting point in considering currently available research evidence. Other relevant scientific findings may have been reported since completion of the review. This report is current to the date of publication and may be superseded by an updated publication on the same topic. You should consult other sources in order to confirm the currency, accuracy and completeness of the information contained in this publication and, in the event that medical treatment is required you should take professional expert advice from a legally qualified and appropriately experienced medical practitioner.

BACKGROUND AND OBJECTIVE

There is general agreement in the medical community that the current medical malpractice system is becoming costly and inefficient.¹ Litigation costs can range from 2.4% to 10% of healthcare spending, while unnecessary tests and procedures add further to the healthcare expenditure.¹ The collapsing state of the medical malpractice system is underpinning the belief within healthcare that malpractice litigation “has long since surpassed sensible levels and that major tort reform is overdue”.²

The clinical specialty of obstetrics is under particular scrutiny for paying amongst the highest litigation settlements.^{1,3} Evidence suggest that physician specialists perceived as being under higher liability risks are likely to practice ‘*defensive*’ medicine, whereby their practices are not solely focused on patient’s health, but also on safeguarding against possible medical malpractice liability.¹ In obstetrics, this approach could lead to the potential increase in unnecessary clinical procedures, such as unwarranted cesarean sections.² This implies that choices and options for obstetrical care could be, to some extent, “held hostage by the fear of lawsuits”.⁴ In addition, increased liability could partly influence high levels of dissatisfaction among physicians specializing in obstetrics and are thought to be a driving factor for early retirement, contributing to the shortage of these specialty physicians.⁵

It is important to make sure that we take a well-balanced, strategic approach to medical and obstetrical malpractice reforms so that the control of malpractice litigation costs is accompanied with the fair compensation of patients injured by medical negligence.¹ Such an approach requires the careful analysis of world-wide policies and their short-term and long-term consequences,^{6,7} taking into account the presence of multiple stakeholders including patients, clinicians, healthcare managers, and policy makers who have conflicting interests.⁸

The objective of our study was to complete a rapid scoping review to map all available evidence in the literature regarding medical malpractice models/frameworks/policies to control damages in obstetrical procedures across all countries.

METHODS

Definition of a rapid scoping review

A scoping review aims to “map the literature on a particular topic or research area and provide an opportunity to identify key concepts, gaps in the research; and types and sources of evidence to inform practice, policymaking, and research”.⁹ A scoping review includes the following 5 stages: 1) identifying the research question; 2) identifying relevant studies; 3) study selection; 4) charting the data, and; 5) collating, summarizing and reporting the results.

To be able to provide an answer to policy makers in a timely manner, a rapid review approach was used. Rapid reviews are a form of knowledge synthesis in which components of the systematic review process are simplified or omitted to produce information in a timely manner.¹⁰

Information sources and literature search

To identify potentially relevant studies for inclusion, the following bibliographic databases were searched for publications in English from 2004 onwards: MEDLINE (OVID interface), EMBASE (OVID interface), LexisNexis Academic, the Legal Scholarship Network, Justis, LegalTrac, QuickLaw and HeinOnline. The search strategies were drafted by an experienced librarian, which was further refined through team discussion. The general search terms included those related to medical malpractice, statutes of limitation, financial limitation, limited damages, impact on damages and restricted statutes. The final search strategy for MEDLINE can be found in Appendix 1, which was adapted for subsequent databases, as necessary. Full literature searches for the other databases are available upon request. The final search result was exported into EndNote and duplicates were removed by the information specialist. The electronic database search was supplemented by searching the Canadian Medical Protective Association website and scanning the reference lists of the included papers.

Eligibility criteria

Inclusion criteria were defined using the ‘Patients, Interventions, Comparators, Outcomes, Study designs, Timeframe’ (PICOST) framework,¹¹ as follows:

Patients: patients of all ages who have undergone an obstetrical procedure and experienced an adverse event, such as a medical error.

Interventions: medical malpractice policies, frameworks, or models, such as reforms, tort reforms, damage award limits, frivolous suit penalties, expert witness requirements, statutes of limitations, immunity provisions, and no fault compensations. Patient safety initiatives were included if they were policies/models implemented at the population level (e.g., country-wide, state-wide).

Comparators: other policy reforms/models/frameworks or no policy or no comparator.

Outcomes: litigation costs, cost containment.

Study designs: all types of study designs, commentaries, and editorials.

Timeframe: from 2004-2015

Other limitations: published documents written in the English language.

Study selection

The screening criteria were established *a priori* and calibrated on a random sample of 50 citations amongst the team through a series of pilot-tests. After >90% agreement was observed, pairs of reviewers screened the literature search results, independently, and discrepancies were resolved through discussion or a third adjudicator. All screening was performed using our online tool, Synthesi.SR (<http://knowledgetranslation.ca/sysrev/login.php>), proprietary software available through the Li Ka Shing Knowledge Institute of St. Michael’s Hospital.

The same steps were followed for full-text review of potentially relevant articles identified from the citation screening.

Data abstraction

A data abstraction form was developed *a priori* and pilot-tested by all team members independently on a random sample of 3 articles and revised iteratively by the study team. Two reviewers independently read each document and extracted relevant data using the standardized data extraction form. Any discrepancy was resolved by discussion or by a third reviewer.

The extracted data included study characteristics (e.g. first author, year of publication, publication type, etc.) and information related to reforms to control damages and financial liabilities.

Synthesis

The findings of this review are presented narratively. The models/frameworks/policies/reforms to control damages and financial liabilities identified are presented in tables and categorized by type of strategy, obstetrical issue, and country of origin for the policy.

RESULTS

The literature search yielded a total of 3,004 citations (Figure 1). Of these, 454 citations were potentially relevant and their full-texts were reviewed. Subsequently, 43 reports fulfilled our eligibility criteria and were included.^{6,12-53} The full citation for the included papers can be found in Appendix 2.

Report characteristics

The majority of the reports (n=31) were focused on the United States.^{12-26,29,30,32,34-37,39,40,44-47,49,52,53} Eight^{6,27,28,38,42,43,50,51} reports focused on another country, such as Canada, Denmark, United Kingdom and Japan, and four^{31,33,41,48} reports included models that were implemented across various countries. Most of the reports (n=34) were discussion papers and a small number of research studies met our inclusion criteria (Table 1).

Policies, frameworks and models

A number of initiatives for improving the medical malpractice area were reported. A detailed summary of the strategies according to type of intervention is provided in Table 2, as follows:

1. No-fault approach (includes strategies when medical injuries are compensated without proof of fault)
2. Safety program and practice guidelines (includes strategies for reduction and mitigation of unsafe acts within the healthcare system, and the use of best practices shown to lead to optimal patient outcomes)
3. Specialized courts and alternative claim resolution (includes an alternative to judicial courts (i.e., specialized health courts or administrative models) for handling medical malpractice claims that are characterized by the use of specially trained adjudicators, independent expert witnesses, and predictable damage awards)
4. Communication and resolution (includes strategies that involve communication between physician and patient outside the court-room setting to reach a mutual agreement on dispute and fair compensation)
5. Caps on compensation and attorney fees (includes strategies that limit the amount of non-economic or punitive damages that may be awarded for a case)
6. Alternative payment system and liabilities (includes strategies that reduce the burden of liability pressure and financial burden of claims payment)
7. Limitations on litigation (includes strategies that limit the type and amount of medical malpractice claims entering the system)
8. Multi-component models (e.g., includes multiple components of the above)

A total of ten articles were included that evaluated the proposed policy.^{16,23,26,34,37,42,45-47,50} Eight of them were developed in the USA,^{16,23,26,34,37,45-47} one in the UK,⁵⁰ and one in Canada.⁴² In addition, four papers included specific interventions related to Cerebral Palsy and are presented in Table 3.^{28,35,38,39}

The strategies will be briefly described below according to the country of origin. A full description of the strategies and evaluation of the outcomes can be found in Appendix 3 and 4, respectively.

United States

Most of the included reports^{12-26,29,30,32,34-37,39,40,44-47,49,52,53} were either an overview or a discussion on the situation of medical malpractice and tort reform in the United States. Many reported on multiple strategies. There were five research studies^{16,23,26,46,47} and 26 discussion papers^{12-15,17-22,24,25,29,30,32,34-37,39,40,44,45,49,52,53} that discussed multiple strategies and models for tort-reform in the United States. Eight^{15,16,19,24,35,37,39,53} reports described a no-fault approach as an alternative to the tort-based system. Five^{12,44-47} reports proposed safety programs and practice guidelines to improve patient safety and reduce medical risks that are prone to litigations. Six^{17,19-21,39,40} reports mentioned specialized health courts and administrative model for systematic claims resolution outside the judicial system, while

seven^{17,18,21,23,32,37,40} papers recommended strategies to improve patient-physician communication in the event of a medical error to resolve disputes and to reach a fair compensation agreement. Ten^{15,17,19,22,26,29,34,36,37,49} papers proposed caps on damage awards and attorney fees, four^{15,22,26,53} papers described alternative payment schedule and liabilities to reduce litigation burden, one paper¹⁵ proposed strategies to reduce the type and amount of claims entering the system and six^{13,14,25,29,30,52} papers suggested a multi-component model.

No-fault Approach

Four papers discussed no-fault compensation programs for severe neurologic birth injuries. Berkowitz et al.³⁵ (2009) described a two-pronged program that has been submitted to the New York State legislature as a proposed bill entitled the “Neurologically Impaired Program for New York State”. The program had two components: financial support, and standard of care evaluation and patient safety. The financing of this program is of considerable concern according to the author, but it is believed that elimination of the exorbitant administrative costs of the current tort system will go a long way toward paying for it, but no economic analysis was provided. The patient outcomes of the programs were not reported. Domin (2004)¹⁵ described two similar compensation programs that were enacted in Virginia and Florida. The Virginia Birth-Related Neurological Injury Compensation Program (BIP) is a voluntary, no-fault insurance pool. It legally precludes lawsuits for certain neurological injuries against physicians that choose to pay a yearly fee. Instead, patients must seek compensation from the BIP pool, a process that imposes little burden on physicians. In contrast, physicians that do not pay the yearly fee can be sued for these neurological injuries. The program framers never sought to overhaul the tort system generally, but instead wished to coax insurance companies to cover additional obstetricians. Consequently, they removed the cases that cause the greatest uncertainty in malpractice awards in obstetrics: birth-related neurological injuries. Florida’s Birth-Related Neurological Injury Compensation Act (NICA) also focuses on birth-related neurological injury, which according to the statute’s definition, only refers to a narrow class of injuries. Notably, this already narrow definition only applies to those infants born alive and those over a certain minimum birth weight, thereby further restricting the statute’s applicability and encouraging legal action only for serious injuries resulting in death. The benefits of these programs are said to be reduced legal costs, less delay in monetary recovery, shorter time involvement on the part of the doctors, and decreased incidence of defensive medicine due to the strict liability nature of no-fault. The author reports that some opponents of no-fault liability systems argue that for those cases involving avoidable instances of negligence, a no-fault system by its very name would remove any degree of personal physician responsibility. Bovbjerg (2005)³⁷ also evaluated the programs enacted in Virginia and Florida using administrative closed malpractice claims data as well as parent and physician surveys, which revealed that the programs, as intended, kept obstetric liability coverage available and decreased tort premiums. Administrative claims were much lower than expected (196 during the first 8 years in Florida, 30 in 9 years in Virginia), not unaffordably numerous as some opponents of reform had claimed. Similarly, Edwards (2010)¹⁶ said that Virginia’s tort reform shields participating physicians almost entirely from the negative effects of malpractice claims for certain injuries. As such, it could have a greater impact on physician decision-making than the fluctuating risk that exists within the traditional tort system. On the contrary, analysis of the Virginia Health Information (V.H.I.) database did not support this theory and showed at most, mild evidence suggesting that the Birth Injury Program induces physicians to practice less defensively.

Four papers^{19,24,39,53} broadly described a no-fault system where victims were compensated for defined, medically caused harms without proof of fault within the context of obstetrics malpractice litigation and general medical errors. Chen (2010)⁵³ argued that a no fault-approach would result in quicker and a wider base of compensation, reduced litigation costs, and an idealized outcome for deterrence based on rapid discoveries of errors and peer review. However, the author expressed concerns that a medical no-fault would almost certainly be more expensive than tort-based malpractice liability. Gregg (2005)¹⁹ also mentioned that there was no support for a no-fault system from the medical profession, the plaintiffs’ bar, or the insurance industry. Gurewitsch and Allen (2007)³⁹ discussed a no-fault approach in the context of brachial plexus injury following shoulder dystocia and supports that no-fault programs are successful in

reducing some litigation, while effectively compensating affected individuals. However, he cautions that it may not be applicable and feasible for all birth-related injuries. According to Huang (2009),²⁴ the no-fault approach may successfully reduce the costs of insurance for obstetricians and vaccine suppliers, but it may exclude too many injured patients and it is not clear that the quality of medical care and patient safety improves. None of the studies provided a formal evaluation of the proposed programs.

Safety Programs and Practice Guidelines

Avraham (2011)¹² intended to review the incentives that underlie the USA health system. The author argued that the tort system, lacking expertise and slow to adapt, is unable to overcome cognitive biases to adequately solve the problems. Clinical practice guidelines are seen by the author as a possible solution, but not as they are currently developed. He suggests that guidelines promulgated by healthcare associations are infected by a web of conflict of interest with every player in the industry; government agencies are underfunded and also subject to the industry's web of conflict; and even if adequate guidelines could consistently be produced, state legislatures and courts have been unwilling and unable to substantially incorporate guidelines into the legal landscape. Lastly, this article proposes a private regulation regime that could be a solution, which would align all of the stakeholders' incentives to society's interests.

Pearlman (2006)⁴⁴ discussed medical specialty society efforts that have been successful in addressing the area of patient safety. The efforts focus on the following areas, including quality control measures (and a system to track them); national closed claim reviews; and, development of innovative new products that would increase the likelihood of safe outcomes, and, would create a culture of safety. Although the authors believed that this model would save cost related to liabilities, this was not formally evaluated and patient outcomes were not reported.

Pegalis and Bal(2012)⁴⁵ examined whether safety guidelines derived from analyzing past medical malpractice litigation could reduce costs related to medical liability. Their findings showed that both anesthesia and obstetric physician societies have successfully targeted costs and related concerns arising from medical malpractice lawsuits by using data from closed claims to develop patient safety and treatment guidelines. In both specialties, after institution of safety measures derived from closed medical negligence claims, the incidence and costs related to medical malpractice decreased and physician satisfaction improved. Authors conclude that tort reform, in the form of legislatively prescribed limits on damages arising from lawsuits, is not the only means of addressing the incidence and costs related to medical malpractice litigation.

Pettker et al. (2014)⁴⁶ evaluated a comprehensive obstetric safety program that was implemented in New Haven, Connecticut. The program was comprised of the following elements: external expert review; protocol and guideline development; obstetric safety nurse hiring; educational efforts and monitoring; anonymous event reporting; resident supervision and leadership; creation of an obstetric patient safety committee; Safety Attitude Questionnaire implementation; team training, and; obligation to pass the electronic fetal heart rate certification. They assessed the number of liability cases per 1000 deliveries/per year, claims and payments. The authors reported that the cesarean delivery rate increased over time, which was consistent with national trends. In terms of cost, closed-case analysis (those cases resolved by withdrawal, court judgment, or settlement) revealed that payments were drastically reduced after the patient safety effort, from \$50.7 million to \$2.2 million. Median annual payments, per 1000 deliveries, were significantly lower in the second time period as well (\$1,141,638 vs. \$63,470; P<0.01); this statistically significant result held true when performing the combined [open (claims or suits filed in court but still unresolved at the time of performing the analysis) and closed cases] case analysis as well. To determine whether the patient safety program had any impact on payments to claimants, they analyzed how payments differed across time periods. The median monetary amount per case resulting in payment to the claimant was statistically different in the combined case analysis (\$632,262 vs. \$216,815; P 0.046) and in the closed case analysis (\$632,262 vs. 81,714; P 0.03). Furthermore, there was much less variability in payments, as reflected in a narrowing of the interquartile ranges after initiating their

safety program (interquartile range before \$2,996,068, vs. after \$270,361 [combined cases] and \$267,280 [closed cases]).

Santos et al.(2015)⁴⁷ evaluated a risk reduction labor and delivery model. This multilevel integrated practice and coordinated communication model consisted of four key components: (1) instituting new practice bundles for non-reassuring fetal status (i.e., baby is not getting enough oxygen late in the pregnancy or during childbirth) and shoulder dystocia occurrences with training for physicians and nurses; (2) standardizing and requiring documentation of these bundles; (3) establishing an unintended event disclosure policy, process, and training, and; (4) providing rapid feedback to teams on the model's performance measures. Medical liability risk and administrative data sets were analyzed. They observed a 50% reduction in shoulder dystocia and fetal distress cases and a decrease in malpractice claims.

Specialized Courts and Alternative Claim Resolution

Three papers^{17,20,40} described a non-judicial, specialized court system, such as health courts and arbitration to adjudicate claims of medical injuries in a systematic way. Furrow (2011)¹⁷ described a special court for small medical injuries program intended to be an alternative, rather than an exclusive remedy, with injured patients free to pursue their claims in the traditional tort system. Such a system could proceed on affidavits with a lower threshold of proof of the "adverse event" to allow for swift compensation for smaller injuries that otherwise never receive compensation under the current system. No outcomes or evidence of formal evaluation were provided. Hannah (2009)²⁰ describe a health courts model with a specialized judge and state-appointed neutral experts that would attempt to base compensation decisions upon ex ante determinations about the preventability of common medical mistakes instead of traditional ex post determinations. Once the claimant, with the assistance of an attorney, if needed, proved that the injury could have been avoided, the judge would award non-economic damages based on a schedule of benefits similar to worker's compensation cases, while still taking into account the individual circumstances of each case. The proposed system is believed to be cost-efficient but a formal evaluation was not reported. Similarly, Holbrook (2008)⁴⁰ discussed arbitration to be a court-like, private alternative to litigation. In arbitration, parties submit a dispute to a neutral person called an "arbitrator" (or sometimes a panel of 3 arbitrators) to make a decision after an adversarial, evidentiary hearing (very much like a court trial without a jury). Arbitration can be either mandatory or voluntary, and binding or nonbinding. This article discusses the most common (and most controversial) type of arbitration called "mandatory binding arbitration", where parties are required to submit their dispute to arbitration and also are required to accept the arbitrator's decision. No formal evaluation is reported, but the author reports that binding arbitration is not cheap and a consumer may not be able to pay arbitration fees. Although consumers may win more often, they get smaller awards of money and it is very difficult to get an unfair binding arbitration award overturned by a court.

Two papers^{19,21} discussed medical review and screening panels to review merits of claims using evidential rules more flexible than those used in formal court proceedings. The ultimate goal is to weed out frivolous claims, encourage settlements of meritorious claims, and to decrease malpractice insurance costs for doctors. Gregg (2005)¹⁹ cautioned that although panels have shown some success in reducing frivolous claims, a panel's decision does not bind the plaintiff under some jurisdictions. Under these jurisdictions, plaintiffs can merely use the screening panel as a testing ground for their lawsuit and bolster their case for trial if the first go-round proves unsuccessful. Hedrick (2007)²¹ also found that this reform type significantly affects medical liability premiums, though the extent to which it does so varied by physician specialty; establishing pretrial screening panels reduces obstetrics/gynecology premiums by about 7% the year after they are introduced, while this effect is 20% in the future. None of the papers include a formal evaluation.

Gurewitsch (2007)³⁹ proposed peer review of expert testimony to correct the imbalances in the level of expertise between plaintiff and defense experts. The general intent of many of the proponents of peer review is to effectively "police our own" mainly outside the court system that is, to invoke the possibility of professional consequences (e.g., loss of hospital privileges, revocation of membership in professional

societies, or dismissal from academic departments) for the expert witness whose testimony is found wanting by the panel of peer professionals reviewing it. The hoped-for effect is that fewer experts would be willing to make dogmatic statements that fuel the absolutist arguments; this in turn would curb the level of compensation in those cases won by plaintiffs and with it the incentive to pursue litigation in the first place. No formal evaluation plan or results were mentioned.

Communication and Resolution

Bovbjerg (2005)³⁷ proposed greater disclosure of medical issues to patients and their families as a way to improve injury resolution under liability (or any other compensation system). It is also supported as a matter of ethical obligation or good medical practice for enhancing patient-provider trust. Early experience within the Veteran Affairs health system indicated that disclosure with compensation is cost-effective; however, providers feared that disclosure would further facilitate lawsuits. Furrow (2011)¹⁷ also discussed early offer program to encourage providers to voluntarily agree and promptly compensate patients for avoidable injuries. Under this approach, the patient or provider would file the claim with the insurer when the adverse outcome first occurred. The insurer would then decide whether the injury was covered. If the injury was covered, the insurer would make a prompt payment. Disputes could be resolved through judicial courts or mediation. Neither authors provided formal comparative evaluation of their proposed strategies.

Holbrook (2008)⁴⁰ gave an overview of negotiation and mediation as common alternative dispute resolution (ADR) processes. Negotiation is the attempt of 2 (or more) persons to work together to come up with some mutually agreeable outcome, either by creating a deal or resolving a conflict. Mediation is simply facilitated negotiation in which the parties involved in conflict meet in the presence and with the assistance of an impartial third party called the mediator. Furrow (2011)¹⁷ and Yee (2006)³² also discussed mediation as an alternative dispute resolution. The authors did not provide a comparative evaluation of these approaches.

Three papers^{17,21,23} focused on the impact of apology laws in dealing with medical malpractice litigations. These laws state that apologies made by medical practitioners cannot be used as evidence in medical malpractice litigation. The laws are intended to protect statements of apology made by physicians to affected patients in order to increase the likelihood of their use and possible reduction in the expected damage award that doctors face if the case goes to court. Ho and Liu²³ analyzed data from the National Practitioner Data Bank (NPDB), which contains all medical malpractice cases with nonzero payments made by health practitioners. The authors concluded that the apologies are most valuable for cases involving obstetrics and anesthesia, infants, and improper management by the physician, as well as failures to diagnose. The authors said that programs that encourage effective apologies and disclosure of mistakes can dramatically reduce malpractice payments. The apology and disclosure program at the University of Michigan Health Service reports a decrease of 47% in compensation payments and a drop in settlement time from 20 months to six months after its implementation in 2001. Also, apology laws help expedite the resolution process and reduce claim frequencies.

Caps on Compensation and Attorney Fees

Ten papers^{15,17,19,22,26,29,34,36,37,49} reviewed experiences from several states in the USA with award caps on noneconomic and punitive damages. However, cost savings and comparative evaluation were only reported in three papers. In California, the MICRA (Medical Injury Compensation Reform Act) reduced healthcare costs by 5% to 9% without leading to increases in mortality or medical complications. Indiana and Illinois have had similar patterns of healthcare inflation, which suggests that Indiana's reform has not affected healthcare costs. In addition, there has not been a marked difference in patterns of healthcare expenditures or the number of physicians per 100,000 people in Indiana before and after the reform. Weinstein (2009)⁴⁹ reinforced that "caps" have been proven by others to keep premiums down, to address the manpower needs, to improve the access to healthcare and to decrease healthcare costs. Iizuka (2013)²⁶ found mixed results for caps on noneconomic damages using data from the Nationwide

Inpatient Sample. For example, in one case, caps were associated with a higher probability of medical errors compared to states without these caps. The author explained that these comparisons are only suggestive because many factors, including state fixed-effects, were not controlled

Domin (2004)¹⁵ and Gregg (2005)¹⁹ reviewed experiences with limitations on attorney fees by means of a graduated or sliding scale fee schedule that reduces the contingent fee as the award increases, or by allowing contingent fees to undergo peer review. Authors did not report any comparative evaluation of this approach, but suggested that it reduces the monetary incentive for attorneys and may prevent legitimate suits.

Four papers^{15,19,22,26} proposed abolition of the collateral source rule which typically allows any evidence of outside benefits received by the injured, such as insurance payoffs, be excluded from trial and prohibits any reductions of damages based on such benefits. The intended outcome is to reduce medical malpractice insurance premiums by lowering judgments in malpractice lawsuits. The reform would either make it mandatory to apply an offset for payment from collateral sources or would permit the jury to consider the collateral source payment when determining a plaintiff's award. Based on the Nationwide Inpatient Sample data, Iizuka (2013)²⁶ did not find any definitive results for collateral source reform.

Alternative Payment System and Liabilities

Domin (2004)¹⁵ proposed periodic payments of damages if award exceed a predefined threshold and experience-rated insurance system to ease the burden of payment and premiums. No formal evaluation was reported.

Chen (2010)⁵³ discussed enterprise liability to remove the locus of the responsibility for medical injuries from individual physicians to the larger institutional structure in which most modern medicine is practiced today. According to the author, by aggregating liability at the enterprise level, greater precision in determining malpractice premiums can be achieved, however, hospitals find the vicarious liability imposed by enterprise liability to be an extra and unwelcome burden; physician groups fear loss of professional autonomy. No formal evaluation was provided.

Higgins (2004)²² and Iizuka (2013)²⁶ explored the option of joint and several liability reform, which typically allows the plaintiff to recover the full balance of the award, whether it comes from one or more defendants, without regard to the apportionment of fault among the defendants. Based on Nationwide Inpatient Sample (NIS) data and information on state tort reform (the second data set), Iizuka (2013)²⁶ concluded that states with joint and several liability (JSL) reform have fewer medical errors than states without the reform,

Limitations on litigation

Domin (2004)¹⁵ explored experiences of several states (i.e., California, Louisiana, New York) that have enacted statutes of limitations to lower the type and number of claims entering the system. In California, medical malpractice premiums decreased by 25% in the years immediately following the enactment.

Multi-component Model

Bogue (2013)¹³ specifically aimed to explore cost containment¹³. The authors analyzed how the medical malpractice reform provisions of the Cost Bill will likely have an impact on controlling costs in the Massachusetts healthcare system. The Cost Bill implements multiple medical malpractice reforms, using both traditional modifications (Damage award caps) and non-traditional theories (Disclosure and apology statute) to improve overall healthcare cost control, system transparency, and quality improvement. The Cost Bill seeks to change many aspects of Massachusetts' current healthcare delivery system in an effort to cut \$200 billion in healthcare spending. However, this paper did not provide a formal evaluation of limiting damages.

Chow (2007)⁵² discussed The Fair and Reliable Medical Justice Act of 2005. In this report, the Common Good's model is mentioned as the most developed and well-known plan for health courts. This model replaces juries with a tribunal of judges with medical expertise gained through education or experience to establish an understanding of a uniform standard of care. The proposal circumvents the "dueling experts" phenomenon by soliciting testimony from a neutral expert selected by the health court judges. It also attempts to cut the cost of trial by imposing a 20% cap on attorney contingency fees. The model includes a predetermined injury-specific rate schedule to normalize the distribution of noneconomic damages for any given injury from verdict to verdict. There are no available outcomes from this approach.

Conroy (2006)¹⁴ discussed the federal Health Act 2005. The proposed reform initiative included the following: (1) Set the statute of limitations at "3 years after the date of manifestation of the injury or 1 year after the claimant discovers, or through the use of reasonable diligence should have discovered, the injury, whichever occurs first"; (2) Cap damages for noneconomic loss at \$250,000; (3) Limit lawyers' contingency fees; (4) Abolish joint and several liability, adopting a proportionate liability standard instead; (5) Abolish the collateral source rule; (6) Eliminate the recovery of punitive damages except for certain intentional torts, and specify the exclusive factors to be considered in determining an appropriate amount of punitive damages not to exceed \$ 250,000 or "two times the amount of economic damages awarded, whichever is greater." The author stated that the effect of the proposed strategy on cost-saving is inconclusive.

Hull et al.(2005)²⁵ provided an overview of legislative enactments in Texas (Texas Alliance for Patient Access, TAPA) and California (Medical Injury Compensation Reform Act, MICRA). Both reforms include a variation of caps on noneconomic damages, limit of attorney contingency fees, statute of limitations and collateral source rule reform as a comprehensive model to reduce the burden of malpractice litigations. In California, MICRA was effective in moderating premium increases compared to national average, reduced average settlement times and costs (settlements are 23% faster and the cost of settlement is 53% lower than the national average) and improved the system's predictability.

Liang and Ren (2004)²⁹ also reported favourable outcomes for MICRA, with lowered insurance premiums and greater access to healthcare for patients in California. The total number of full-time practicing physicians also grew five times faster than California's state population growth and healthcare costs have been reduced by 5% to 9% without leading to increases in mortality or medical complications. The author also discussed experiences Colorado with their enactment of the Health Care Availability Act (HCAA), which has a similar model to MICRA, and found the reform to be successful with no discernible challenges in affordability or accessibility, but reduction in medical liability premiums due to the reform is still uncertain.

McAfee (2005)³⁰ also discussed the Bush administration's proposed tort reform with a similar model to MICRA, TAPA and HCAA. The American Osteopathic Association believed that the proposed tort reform will increase patients' access to doctors in high risk practices, many doubt that tort reform will solve doctors' insurance problems. For example, decreases in medical malpractice premiums were not attained in Florida with capped noneconomic damage awards.

Focusing on the current medical malpractice and liability insurance crisis, the American Medical Association and numerous specialty societies promoted an administrative, but fault-based, system to better resolve injuries.^{24,37} Other authors contributed to this discussion^{15,30} by examining the medical malpractice insurance crisis and providing possible solutions to the medical malpractice crisis including interventions such as the Virginia Birth-Related Neurological Injury Compensation Act¹⁵ and a tort reform³⁰ that will increase patients' access to doctors who have experienced with high-risk patients; proponents of caps to stabilize the insurance market, provide affordable coverage, and assure that health care providers will buy coverage and it does not affect a plaintiff's ability to be fully compensated for economic damages.

Canada

One research study⁶ and one discussion paper⁴² reported on medical malpractice and tort-reform within the Canadian context. Milne et al.⁴² discussed the impact of the Managing Obstetrical Risk Efficiently (MORE) program at Canadian Hospitals after 10 years of implementation. The program consists of three educational modules, each about 12 months in length: (1) 'Learning together'; (2) 'Working together' and; (3) 'Changing culture'. The end goal of the program was to change the culture of blame to a culture of patient safety. Survey results from 174 Canadian hospitals participating in the program as well as claims data from 39 participating hospitals insured for liability by the Healthcare Insurance Reciprocal of Canada were analyzed. The same participants (e.g., nurses, midwives, family physicians, and obstetricians) were assessed for clinical core content knowledge and behavioural change in three different time periods. Results of these aggregate data revealed the following: the average score increased for each profession in all hospital environments (primary, secondary, tertiary) when pre-test and post-tests were compared, and; the pre-test results varied by profession, with a range of 17.5%. This inter-professional range decreased to 5.1% by the third post-test. The p-value for each time period was less than 0.001, indicating a significant difference in behavioural change. A significant reduction ($p < 0.001$) was shown in average costs incurred in the obstetrics labour and delivery units after the onset of the program. Additionally, the researchers predicted a 40% reduction in the total litigation costs incurred over one year, but this was not confirmed with data.

The Canadian Medical Protective Association⁶ described four alternative models (i.e., no-fault, combination fault/no-fault, government sponsored indemnification of medical injuries and severely compromised infant program) in the Canadian context. The goal was to facilitate constructive discussion of both alternative patient compensation models and improvements to the existing tort-based system related to birth-related neurological injury. The authors note that this would make the tort system less controversial and likely add between \$221 million and \$383 million per year to the total cost of medical treatment injury indemnification.

United Kingdom

One research study⁵⁰ and two discussion papers^{38,43} described medical malpractice litigations and tort-reform from the United Kingdom perspective. In 2012, the National Patient Safety Agency compiled a list of 'never events' with the aim of raising awareness of such incidents.⁴³ The driving force behind the creation of such a list is to reduce serious and potentially life-threatening incidents occurring in the National Health Service (NHS). By officially publishing a list of such events, their importance is emphasized and brought to the attention of all healthcare professionals. The long-term objective is to minimize the incidence of these life-threatening events and work towards an optimal patient-safety environment.

Capstick³⁸ gave an overview on alternative patient compensation models on litigation. The proposed NHS redress scheme will provide an administrative rather than a judicial route for claims up to £30 000 (€43 640, \$54 420) and claims arising from severe neurological impairment related to birth. The redress scheme proposes that hospitals investigate all adverse events, not only in response to a complaint or claim by the patient.

A research study⁵⁰ described steps (entitled the Clinical Negligence Scheme) taken to develop a set of risk management standards for maternity services by a group of risk management assessors with nursing and midwifery experience. The standards cover a range of both reactive and proactive risk management systems and processes. They also examined whether there is evidence that the standards have had a measurable effect on clinical negligence claims. They observed a decrease in the number and cost of maternity claims as a percentage of total clinical negligence claims. However, no definitive data were found to demonstrate that the program has had any impact on patients.

Denmark

One study⁵¹ focused on the advantages of a centralized compensation system for handling obstetric injury claims in Denmark. The author argued that perhaps a centralized compensation system for

handling patient injuries is crucial in order to comprehend the scope of the problem. Costs savings and patient outcomes were not formally evaluated.

Japan

Leflar^{27,28} gave a comprehensive overview of healthcare law in Japan. The first article²⁷ addressed a private law innovation and introduced Japan's new no-fault program for compensating birth-related obstetrical injuries. The second article²⁸ also mentioned a recently implemented no-fault compensation system for birth-related injuries. Although these programs have shown to reduce damages, a formal evaluation of its effects on the quality of obstetrical care and on malpractice claims and litigation was not performed.

Comparisons among different countries

A total of four reports^{31,33,41,48} reviewed and/or compared different models and programs across several countries including Canada, United States, United Kingdom, Australia and New Zealand, Norway, Sweden, Denmark and France. Some of the themes that were discussed included informed consent as means to mitigate lawsuits and adverse outcomes, administrative systems of patient compensation for injuries arising from medical care, award compensation to a defined group of infants with birth-related injuries. Patient outcomes were not reported and a formal evaluation of damages was not conducted.

Advantages and Limitations

A number of advantages and limitations were reported. Details on all reported advantages and limitations articles included in this scoping review by policies/frameworks/models can be found in Appendix 5. Some of the advantages across the various models and frameworks include:

- 1) The NHS redress scheme showed a reduction of the defense costs incurred in processing compensation payments³⁸
- 2) Collateral source rule reform either permits or requires courts to reduce awards by the amount paid to the plaintiff by collateral sources, which is likely to reduce the liability pressure on the medical provider²⁶
- 3) Patient safety guidelines improved safety, lessened litigation, decreased deaths, reduced medical malpractice insurance premiums, and led to happier health care professionals⁴⁵
- 4) Clinical Negligence Scheme for Trusts provides NHS trusts with a set of risk management standards for maternity services. These standards have improved communication and ensures that staff are trained and competent in their duties to treat avoid medical risks, and proactively identify new or potential risks that may be avoided⁵⁰

Some of the limitations reported included:

- 1) Capstick (2004) suggests that the NHS redress scheme might greatly increase the number of inquiries into clinical practice and, therefore the number of litigation claims would also be likely to increase³⁸
- 2) In practice, there is no support for a no-fault system -- not from the medical profession, not from the plaintiffs' bar, and not from the insurance industry¹⁹
- 3) Many doubt that the Bush administration's proposed tort reform involving caps on non-economic damages or punitive damages, statute of limitations and periodic payments will solve physicians' insurance problems. A number of patient and consumer groups have strongly criticized it because patients would not have access to specialized medico-legal advice essential to influence decisions about their claims, robust mechanisms to ensure learned patient safety lessons are also lacking.³⁰

DISCUSSION

We conducted a rapid scoping review to identify medical malpractice policies that can reduce legal damages. Despite the enormous costs associated with medical malpractice litigation, very few papers described such models. Most of the literature is from the United States, which is likely because of the large number of medical malpractice claims that occur per year. None of the included papers originated from low to middle income economy countries.

A number of initiatives for improving the medical malpractice litigation system were found, including no-fault approaches, safety programs and practice guidelines, specialized courts and alternative claim resolution, communication and resolution, caps on compensation and attorney fees, alternative payment system and liabilities, limitations on litigation and multi-component models.

Some have noted that honest disclosure of harm and a related apology may reduce litigation rates.⁵⁴ In Canada, an apology is defined as expressing sympathy, regret, or words and actions showing contrition or commiseration whether or not the admission of fault is admitted or implied. Apology legislation is recommended by the Uniform Law Conference of Canada and the Canadian Patient Safety Institute. These laws are intended to provide a neutral environment for an open disclosure and to prevent future use of the apology statement as an admission of negligence and liability in a medico-legal setting. The Canadian Medical Protective Association provides further advice on disclosure.⁵⁵

Communication and resolution programs (also referred to as early compensation programs or early offer programs) have increased in popularity in the United States. Examples include the Veterans Affairs system in Lexington,⁵⁶ University of Michigan⁵⁷ and the Harvard insurer CRICO.⁵⁸ However the fairness of these programs to appropriately compensate patients is a potential limitation to such programs. In order to surmount this, some programs have arrangements with the state licensing regulatory authority not to report certain financial settlements paid to patients, obviating the need for physicians to be involved with reporting the settlement to the United States National Practitioner Data Bank. Other countries have not adopted this approach (e.g., United Kingdom, Australia Canada). In Canada, most hospitals are not resourced sufficiently to fairly determine negligence and adequate compensation. Such legal and monetary determinations are complex, and independent bodies such as the courts and regulatory authorities (i.e., Medical Colleges) have the responsibility to make these determinations fairly.

Most of the proposed policies were thought to decrease cost of litigation. However, they were based on the opinions of the authors. Ten^{16,23,26,34,37,42,45-47,50} included reports conducted a formal evaluation of the medical malpractice framework. Bovbjerg (2005)³⁷ found that the administrative compensation model kept obstetrical liability coverage available and decreased tort premiums. Claims were much lower than expected (196 during the first 8 years in Florida, 30 in 9 years in Virginia). Behrens (2011)³⁴ found that the Mississippi tort reform legislation (particularly the limit on noneconomic damages and pre-suit notice) have reportedly enabled MACM to resolve some claims more easily; these reforms have also significantly reduced the frequency of both claims and lawsuits. Edwards (2010)¹⁶ found that Virginia's tort reform shields participating physicians almost entirely from the negative effects of malpractice claims for certain injuries; results do not support the theory of reduced defensive medicine and provide at most mild evidence suggesting that the Birth Injury Program induces physicians to practice less defensively. Milne et al. (2013)⁴² reported that patient safety showed the highest average increase over an incremental time period, with a 20% increase and a significant reduction ($p < 0.001$) in average incurred costs in the obstetrics labour and delivery units after the onset of the program. Ho and Liu (2011)²³ found that using apology laws decreased compensation payments by 47%. They also found that apology laws expedited the resolution process and the number of claims. Pegalis and Bal (2012)⁴⁵ found that the Managing Obstetrical Risk Efficiently (MORE) program led to the highest average increase in patient safety over an incremental time period, with a 20% increase and liability claims had a significant reduction ($p < 0.001$) in the obstetrics labour and delivery units after the onset of the program. Pettker et

al. (2014)⁴⁶ evaluated a comprehensive obstetric safety program, which resulting in significantly less median payment per case to the claimant. Santos et al. (2015)⁴⁷ showed that after 27 months post program implementation, reporting of unintended events increased significantly (43 vs. 84 per 1000 births, $p < .01$) while high-risk malpractice events decreased significantly (14 vs. 7 per 1000 births, $p < .01$). Winn (2007)⁵⁰ were unable to show that the program have made a difference to patients when measured by outcomes such as claims. Iizuka (2013)²⁶ found that states with caps on punitive damages have more medical errors than the states without these caps and that states with joint and several liability reform have fewer medical errors than states without the reform.

There are some limitations to our scoping review worth mentioning. Since this was a scoping review, we did not appraise the methodological quality of the included studies. As a result, we are unable to formally comment on the scientific rigour of the papers or evaluations. Due to the six week timeline for the conduct of this rapid scoping review, we were unable to fully scan the reference lists of included papers. However, we have provided a list of potentially relevant citations that were mentioned in the included studies (Appendix 6). Additionally, we did not have the time to contact authors for further information. We limited inclusion to papers written in English, which might be why we did not identify any papers from low and middle-income countries. We also did not conduct a comprehensive search for difficult to locate or unpublished studies (i.e., grey literature). Furthermore, we focused inclusion on papers that specifically mentioned the obstetric field. As such, medical malpractice models that might be relevant to obstetrics, but have not explicitly described malpractice risks in obstetrics may have been excluded as this was not the focus of the paper.

In conclusion, there are only a few examples of medical malpractice models for reducing litigation costs, specifically in the obstetrics medical specialty. We have identified only 10 formal evaluations. We suggest that any policy that is implemented be assessed for effectiveness, alongside an economic analysis.

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REFERENCES

1. National Conference of State Legislatures. Medical malpractice reform. *Health Cost Containment and Efficiencies NCSL, Briefs for State Legislators. Vol 16* October 2011; 71-74. Available at: <http://www.ncsl.org/documents/health/IntroandBriefsCC-16.pdf>. Accessed July 2015.
2. Studdert DM, Mello MM, Brennan TA. Medical malpractice. *N Engl J Med.* Jan 15 2004;350(3):283-292.
3. Knox GE, Simpson KR, Garite TJ. High reliability perinatal units: an approach to the prevention of patient injury and medical malpractice claims. *J Healthc Risk Manag.* Spring 1999;19(2):24-32.
4. Schifrin BS, Cohen WR. The effect of malpractice claims on the use of caesarean section. *Best Practice & Research Clinical Obstetrics & Gynaecology.* 2013;27(2):269-283.
5. Anderson BL, Hale RW, Salsberg E, Schulkin J. Outlook for the future of the obstetrician-gynecologist workforce. *American Journal of Obstetrics and Gynecology.* 2008;199(1):88 e81-88.
6. The Canadian Medical Protective Association (CMPA). *Medical liability practices in Canada: towards the right balance.* August 2005.
7. Cortez N. A medical malpractice model for developing countries? *Drexel Law Review.* 2011;4.
8. Chervenak FA, McCullough LB. Neglected ethical dimensions of the professional liability crisis. *American Journal of Obstetrics and Gynecology.* 2004;190(5):1198-1200.
9. Daudt HM, van Mossel C, Scott SJ. Enhancing the scoping study methodology: a large, inter-professional team's experience with Arksey and O'Malley's framework. *BMC Medical Research Methodology.* 2013;13:48.
10. Ganann R, Ciliska D, Thomas H. Expediting systematic reviews: methods and implications of rapid reviews. *Implement Sci.* 2010;5:56.
11. Stone PW. Popping the (PICO) question in research and evidence-based practice. *Appl Nurs Res.* 2002;15:197-198.
12. Avraham R. Clinical practice guidelines: the warped incentives in the U.S. healthcare system. *American Journal of Law & Medicine.* 2011;37(1):7-40.
13. Bogue K. Innovative Cost Control: An Analysis of Medical Malpractice Reform in Massachusetts *Journal of Health & Biomedical Law.* 2013:150-183.
14. Conroy AD. Lessons learned from the "laboratories of democracy": a critique of federal medical liability reform. *Cornell Law Review.* 2006;91(5):1159-1202.
15. Domin S. "Where Have All the Baby-Doctors Gone? Women's Access to Healthcare in Jeopardy: Obstetrics and the Medical Malpractice Insurance Crisis". *Catholic University Law Review.* 2004;53:499.
16. Edwards C. The Impact of a No-Fault Tort Reform on Physician decision-making: a look at Virginia's Birth Injury Program. *Revista Juridica Universidad de Puerto Rico.* 2010;80.
17. Furrow B. The patient injury epidemic: medical malpractice litigation as a curative tool. *Drexel Law Review.* 2011;4(41).
18. Geckeler G. "The Clinton-Obama Approach to Medical Malpractice Reform: Reviving the Most Meaningful Features of Alternative Dispute Resolution". *Pepperdine Dispute Resolution Law Journal.* 2007;8(1).
19. Gregg C. "The Medical Malpractice Crisis: A Problem with No Answer?". *Missouri Law Review.* 2005;70(1).
20. Hannah A. A Look Into the Magic Eight Ball: Would Health Courts Survive Judicial Scrutiny in Missouri? "Signs Point to Yes". *UMKC Law Review.* 2009;77.
21. Hedrick V. "The Medical Malpractice Crisis: Bandaging Oregon's Wounded System and Protecting Physicians". *Willamette Law Review.* 2007.
22. Higgins J. Recent Developments in Oklahoma Law: Oklahoma's Tort Reform Act: Texas-Style Tort Reform or Texas-Size Compromise? *Oklahoma Law Review.* 2004;57:921.

23. Ho B, Liu E. "What's an Apology Worth? Decomposing the Effect of Apologies on Medical Malpractice Payments Using State Apology Laws". *Journal of Empirical Legal Studies*. December 2011;8(S1):177-199.
24. Huang H, Soleimani F. "What Happened to No-Fault? The Role of Error Reporting in Healthcare Reform". *Houston Journal of Health Law & Policy*. 2009;1(34).
25. Hull M, Cooper RB, Bailey CW, Wilcox DP, Gadberry GJ, Wallach M. "House Bill 4 and Proposition 12: An Analysis with Legislative History, Part One: Background and Overview". *Texas Tech Law Review*. 2005;36(1).
26. Iizuka T. Does higher malpractice pressure deter medical errors? *Journal of Law and Economics*. 2013;56(1):161-188.
27. Leflar R. Public and Private Justice: Redressing Health Care Harm in Japan. *Drexel Law Review*. 2011;4(243):243-264.
28. Leflar R. Symposium on Medical Malpractice and Compensation in Global Perspective Part II: the Law of Medical Misadventure in Japan. *Chicago-Kent Law Review*. 2012;87(1).
29. Liang BA, Ren L. Medical liability insurance and damage caps: getting beyond band aids to substantive systems treatment to improve quality and safety in healthcare. *American Journal of Law & Medicine*. 2004;30(4):501-541.
30. McAfee J. "Medical Malpractice Crisis Factional or Fictional?: an Overview of the GAO Report as interpreted by the Proponents and Opponents of Tort Reform". *Journal of Medicine and Law*. 2005;9(161).
31. van Boom W, Pinna A. "Shifts from Liability to Solidarity: The Example of Compensation of Birth Defects". *Springer, Vienna*. 2007.
32. Yee F. "Mandatory Mediation: the Extra Dose Needed to Cure the Medical Malpractice Crisis". *Cardozo Journal of Conflict Resolution*. 2006;7:393.
33. Gilmour J. "Patient Safety, Medical Error and Tort Law: an International Comparison". May 2006.
34. Behrens MA. Medical liability reform: a case study of Mississippi. *Obstetrics and Gynecology*. 2011;118(2 Pt 1):335-339.
35. Berkowitz RL, Hankins G, Waldman R, Montalto D, Moore K. A proposed model for managing cases of neurologically impaired infants. *Obstetrics and Gynecology*. 2009;113(3):683-686.
36. Berkowitz RL, Montalto D. Tort reform: why is it so frequently unobtainable? *Obstetrics and Gynecology*. 2010;116(4):810-814.
37. Bovbjerg RR. Malpractice crisis and reform. *Clinics in Perinatology*. 2005;32(1):203-233.
38. Capstick B. The future of clinical negligence litigation? *The BMJ*. 2004;328(7437):457-459.
39. Gurewitsch ED, Allen RH. Shoulder dystocia. *Clinics in Perinatology*. 2007;34(3):365-385.
40. Holbrook J. Negotiating, mediating, and arbitrating Physician-Patient Conflicts. *Clin Obstet Gynecol*. 2008;51(4):719-730.
41. Miller LA. Health courts: an alternative to traditional tort law. *Journal of Perinatal & Neonatal Nursing*. 2011;25(2):99-102.
42. Milne JK, Walker DE, Vlahaki D. Reflections on the Canadian MORE(OB) obstetrical risk management programme. *Best Practice & Research Clinical Obstetrics & Gynaecology*. 2013;27(4):563-569.
43. Nazeer S, Shafi M. Never Events. *Obstetrics, Gynaecology and Reproductive Medicine*. 2012;22(5):135-137.
44. Pearlman MD. Patient safety in obstetrics and gynecology: an agenda for the future. *Obstetrics & Gynecology*. 2006;108(5):1266-1271.
45. Pegalis SE, Bal BS. Closed medical negligence claims can drive patient safety and reduce litigation. *Clinical Orthopaedics and Related Research*. 2012;470(5):1398-1404.
46. Pettker CM, Thung SF, Lipkind HS, et al. A comprehensive obstetric patient safety program reduces liability claims and payments. *American Journal of Obstetrics and Gynecology*. 2014;211(4):319-225.
47. Santos P, Ritter GA, Hefele JL, Hendrich A, McCoy CK. Decreasing intrapartum malpractice: Targeting the most injurious neonatal adverse events. *Journal of Healthcare Risk Management*. 2015;34(4):20-27.

48. Strunk A, Queenan, J. Beyond Negligence Administrative Compensation for Adverse Medical Outcomes. *Obstetrics and Gynecology*. 2010;115(5):896-903.
49. Weinstein SL. Medical Liability Reform Crisis 2008. *Clinical Orthopaedics and Related Research*. 2009;467(2):392-401.
50. Winn SH. Assessing and credentialing standards of care: the UK Clinical Negligence Scheme for Trusts (CNST, Maternity). *Best Practice & Research Clinical Obstetrics & Gynaecology*. 2007;21(4):537-555.
51. Milland M, Christoffersen J, Hedegaard M. Reply: The advantages of a centralized compensation system for handling obstetric injury claims. *Acta Obstetrica et Gynecologica Scandinavica*. 2014;93(4):430-431.
52. Chow E. Health courts: an extreme makeover of medical malpractice with potentially fatal complications. *Yale Journal of Health Policy Law and Ethics*. 2007;7(2):387-427.
53. Chen BK. Defensive medicine under enterprise insurance: do physicians practice defensive medicine, and can enterprise insurance mitigate its effect? 5th Annual Conference on Empirical Legal Studies Paper; July 7 2010; New Haven, Connecticut.
54. McLennan S, Rich LE, Truog RD. Apologies in medicine: Legal protection is not enough. *Canadian Medical Association Journal*. 2015;187(5):E156.
55. The Canadian Medical Protective Association (CMPA). Disclosing harm from healthcare delivery, Open and honest communication with patients. 2015; Second Edition:https://www.cmpa-acpm.ca/documents/10179/24891/com_15_disclosure_handbook-e.pdf. Accessed July 2015.
56. U.S. Department of Veterans Affairs. Lexington VA Medical Center. <http://www.lexington.va.gov/>. Accessed July 2015.
57. U.S. Department of Veterans Affairs. VA Ann Arbor Healthcare System. <http://www.annarbor.va.gov/>. Accessed July 2015.
58. Harvard Medical Institutions. CRICO. <https://www.rmfi.harvard.edu/>. Accessed July 2015.

Figure 1. Review Study Flow

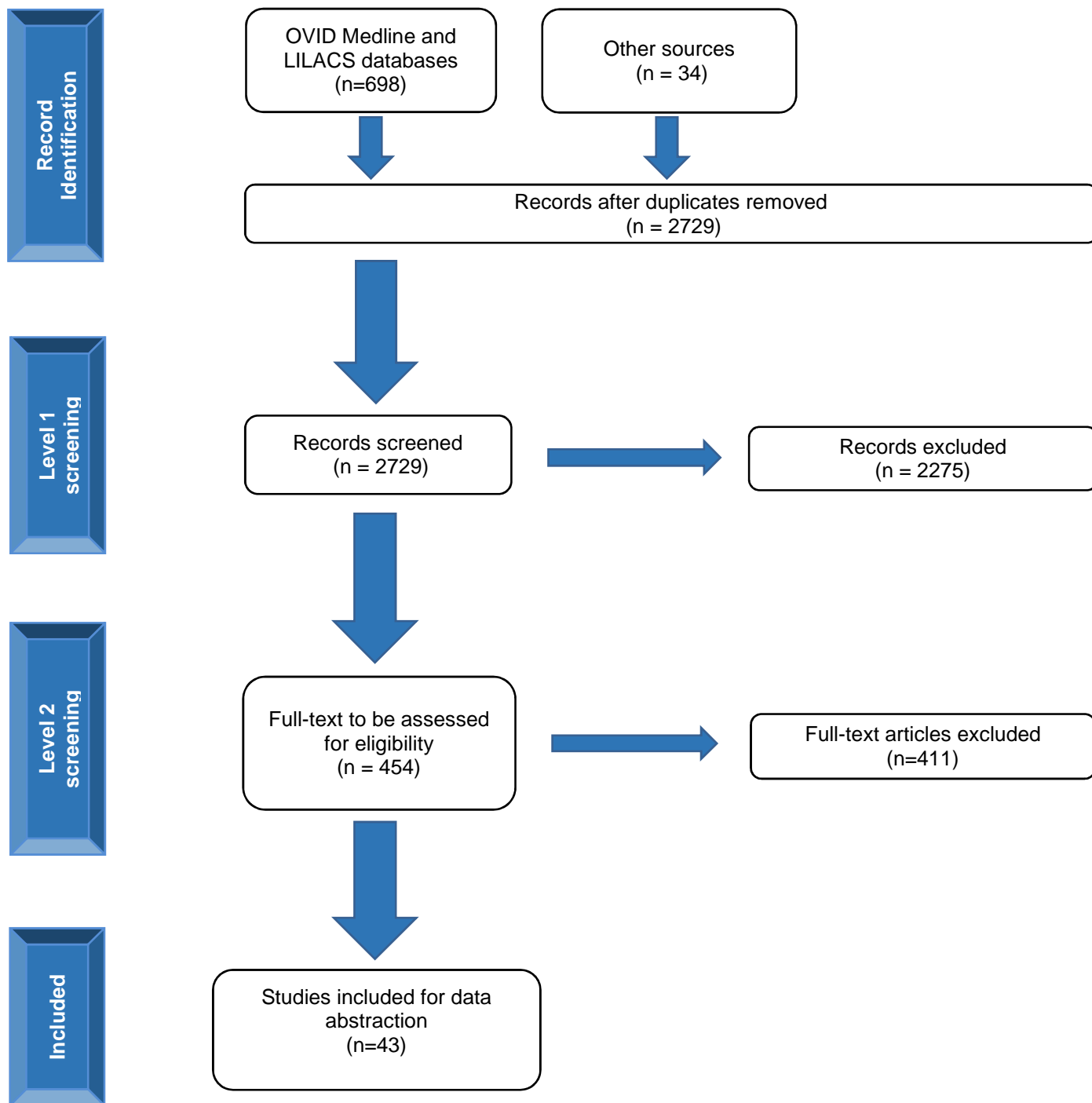


Table 1. Study Characteristics Summary

Summary of Publication Characteristics (n=43)	Count (%)
Year of Publication	
2004-2007	19(44%)
2008-2011	16(37%)
2012-2015	8(19%)
Country of Publication	
USA	34 (79%)
UK	3 (7%)
Canada	3 (7%)
Japan	1 (2%)
Denmark	1 (2%)
Netherlands	1 (2%)
Country the strategy is aimed for/explored	
USA	31 (72%)
UK	3 (7%)
Canada	2 (5%)
Japan	2 (5%)
Denmark	1 (2%)
Multinational	4 (9%)
Publication Type	
Research study	7 (16%)
Review of models	2 (5%)
Other (i.e., commentary, discussion paper)	34 (79%)

Table 2. Summary of Strategy Characteristics

First Author, Year	Setting(s)	Short name of the strategy	Program/Model/Policy description	Type of adverse event	Evaluation Outcome
No Fault Approach					
Berkowitz, 2009 ³⁵ ; Domin, 2004 ¹⁵ ; Edwards, 2010 ¹⁶ ; van Boom, 2007 ³¹ ; Strunk, 2010 ⁴⁸ ; Miller, 2001 ⁴¹ ; CMPA, 2005 ⁶	USA (New York, Virginia, Florida), Canada, UK	Neurologically Impaired Program for New York State, Virginia Birth-Related Neurological Injury Compensation Program (BIP), Florida's Birth-Related Neurological Injury Compensation Act (NICA), redress scheme	Award compensation to a defined group of infants who have birth-related neurologic injuries. Compensation is based on a link between the outcome and the birth process, not on negligence elements as in tort law. Although there are differences between the programs, both programs share common concepts and requirements: participation of physicians, nurses, and hospitals is voluntary and fee-based; the programs cover medical expenses and legal fees for qualified infants; and they require notice to patients of participation	perinatal injury, birth-related neurological injury	Virginia's tort reform shields participating physicians almost entirely from the negative effects of malpractice claims for certain injuries; results do not support the theory of reduced defensive medicine and provide at most mild evidence suggesting that the Birth Injury Program induces physicians to practice less defensively. ¹⁶
Bovbjerg, 2005 ³⁷ ; Chen, 2010 ⁵³ ; CMPA, 2005 ⁶ ; Gilmour, 2006 ³³ ; Gregg, 2005 ¹⁹ ; Gurewitsch, 2007 ³⁹ ; Huang, 2009 ²⁴ ; Leflar, 2011 ²⁷ ; Leflar, 2012 ²⁸ ; Milland, 2014 ⁵¹ ; Strunk, 2010 ⁴⁸ ; van Boom, 2007 ³¹	USA, Canada, New Zealand, Japan, Denmark, Germany, Sweden	administrative compensation model, no-fault liability, no-tort compensation, no-fault insurance, centralized compensation system, trust fund	A basic no-fault approach involves patients who are injured as a result of a predetermined set of compensable medical events (often called designated compensable events) along with a fixed schedule of damages, both economic and noneconomic. An administrative system then handles patient claims and resolves factual disputes, without officially penalizing physicians.	general medical malpractice, obstetrics, vaccines	Administrative data of closed malpractice claims and survey revealed that the programs, as intended, kept obstetric liability coverage available and decreased tort premiums. Administrative claims were much lower than expected (196 during the first 8 years in Florida, 30 in 9 years in Virginia), not unaffordably numerous as some opponents of reform had claimed. ³⁷

Safety Program and Practice Guidelines					
Avraham, 2011 ¹² , Milne, 2013 ⁴² , Nazeer, 2012 ⁴³ , Pearlman, 2006 ⁴⁴ , Pegalis, 2012 ⁴⁵ , Pettker, 2014 ⁴⁶ , Santos, 2015 ⁴⁷ , Winn, 2007 ⁵⁰	USA, Canada, UK	Private Regulation Regime (PRR), Managing Obstetrical Risk Efficiently (MORE), "never events" list and guidelines, Recommendations for Improved Patient Safety, Patient safety guidelines, Obstetric safety program, risk reduction labor and delivery model, Clinical Negligence Scheme for Trusts	combination of privatized and competitive evidence-based guidelines, educational modules and safety training programs for practitioners, error/incidence reporting system, unintended event disclosure policy, process, and training; outside expert review/audit and risk management models	any medical malpractice, obstetrics	<p>Managing Obstetrical Risk Efficiently (MORE) program revealed that Patient safety showed the highest average increase over an incremental time period, with a 20% increase; Liability claims: a significant reduction ($P < 0.001$) was shown in average incurred costs in the obstetrics labour and delivery units after the onset of the program.⁴²</p> <p>Closed claims data revealed that incidence of anesthesia-related deaths dropped from one to two per 10,000 anesthetic procedures to one for every 200,000 procedures.⁴⁵</p> <p>Compared with before Obstetric safety program inception, median annual claims dropped from 1.31 to 0.64 ($P = .02$), and median annual payments per 1000 deliveries decreased from \$1,141,638 to \$63,470 ($P < .01$).⁴⁶</p> <p>After 27 months post implementation of the Risk Reduction Labor and Delivery model, reporting of unintended events increased significantly (43 vs. 84 per 1000 births, $p < .01$) while high-risk malpractice events decreased significantly (14 vs. 7 per 1000 births, $p < 0.01$).⁴⁷</p>

					There are no definitive data to demonstrate that the CNST Maternity Standards have made a difference to patients when measured by outcomes such as claims. ⁵⁰
Specialized Courts and Alternative Claim Resolution					
Furrow, 2011 ¹⁷ ; Leflar, 2011 ²⁷ ; Miller, 2011 ⁴¹ ; Hannah, 2009 ²⁰ ; Holbrook, 2008 ⁴⁰	USA, Denmark, Japan, Sweden	special courts for small medical injuries, healthcare specialty courts, administrative health courts, health court, arbitration	Health courts or arbitration are based on an administrative model and are designed to provide compensation for medical injuries outside of a regular courtroom setting, without a jury, and with a judge or specialized claims handlers or arbitrators who has specialized training in health court adjudication. Medical experts, trained in the same field as the defendant physician, would guide the judge. Compensation consists of both economic and noneconomic damages. These can be either mandatory or voluntary, and binding or nonbinding.	any medical malpractice, obstetrics	NR
Gurewitsch, 2007 ³⁹	USA	peer review of expert testimony	Concern has been raised over imbalances in the level of actual expertise between plaintiff and defense experts. In theory, if experts' qualifications and the content of their opinions could be validated by a community of peers (i.e., similar experts in the field) who would substantiate and differentiate the strength of medical evidence behind the statements made and ensure consistency of opinions proffered by confirming the similarity (or lack thereof) between the medical details of different cases in which such testimony is provided, then justice would be better served because court members would be more assured of the generalizability of the facts on which these cases are argued and decided. The general intent of many of the proponents of peer review is to effectively "police our own" mainly outside the court system that is, to	obstetrics	NR

			invoke the possibility of professional consequences (e.g., loss of hospital privileges, revocation of membership in professional societies, or dismissal from academic departments) for the expert witness whose testimony is found wanting by the panel of peer professionals reviewing it		
Capstick, 2004 ³⁸ , Gilmour, 2006 ³³	UK	NHS redress bill	Provides an administrative rather than a judicial route for claims up to £30 000 (€43 640, \$54 420) and claims arising from severe neurological impairment related to birth. An expert panel will determine eligibility for compensation under the final component of the redress package for smaller claims. This is not a “no fault” scheme, and compensation will depend on some determination of fault.	general, obstetrics	NR
Gregg, 2005 ¹⁹ , Hedrick, 2007 ²¹	USA	screening panels, medical review and screening panel	A panel often comprised of a lawyer, a physician, and a judge, determines the merits of a claim before it is filed in court. These panels are designed to eliminate meritless claims and their associated costs, to encourage settlement of meritorious claims, and to decrease malpractice insurance costs for doctors	general, obstetrics	NR
Communication and Resolution					
Bovbjerg, 2005 ³⁷ , Furrow, 2011 ¹⁷ , Gilmour, 2006 ³³	USA, Australia	disclosure plus patient safety, open disclosure, offer	The elements of open disclosure are an expression of regret, a factual explanation of what happened, the potential consequences of the event, and the steps being taken to manage the event and prevent its recurrence. It has been proposed as a way to improve injury resolution under liability (or any other compensation system)	general, obstetrics	NR
Furrow, 2011 ¹⁷ , Hedrick, 2007 ²¹ , Ho, 2011 ²³	USA	apology law	These laws state that apologies or similar expressions of regret made by medical practitioners cannot be used as evidence in medical malpractice litigation. The laws are intended to protect statements of apology made by physicians in order to increase the likelihood of their use.	any medical malpractice, obstetrics	Using data from NPDB revealed that apologies are most valuable for cases involving obstetrics and anesthesia, for cases involving infants, and for cases involving improper management by the physician and failures to diagnose. ²³

Furrow, 2011 ¹⁷ ; Holbrook, 2008 ⁴⁰ ; Yee, 2006 ³²	USA	mediation	Mediation has been one of the most popular forms of alternative dispute resolution (ADR) proposed. Mediation is simply facilitated negotiation in which the parties involved in conflict meet in the presence and with the assistance of an impartial third party called the mediator. The mediator is the host of a respectful problem-solving process. While an arbitrator, like the judge or jury, is a decision-maker, the mediator plays the role of settlement-facilitator.	obstetrics and other medical malpractice	NR
Holbrook, 2008 ⁴⁰	USA	negotiation	Negotiation is the attempt of 2 (or more) persons to work together to come up with some mutually agreeable outcome, either by creating a deal or resolving a conflict.	obstetrics	NR
Geckler, 2007 ¹⁸ , Strunk, 2010 ⁴⁸	USA	enterprise strict liability, MEDIC Act, binding early offers of recovery, nonbinding voluntary administrative compensation	This approach can involve either a voluntary or mandated disclosure of avoidable injuries or medical error and initiate an offer for a fair compensation payment. Disputes would be resolved through the courts or mediation. Under a strict liability system, failure to disclose medical error can offer additional litigation advantage to the plaintiff. In a binding offer, periodic payment of the patient's net economic losses is guaranteed. In a nonbinding system, compensation offer ceases if the patient involves a lawyer.	any medical malpractice, obstetrics	NR
Caps on Compensation & Attorney Fees					
Behrens, 2011 ³⁴ ; Berkowitz, 2010 ³⁶ ; Bovjerg, 2005 ³⁷ ; Domin, 2004 ¹⁵ ; Furrow, 2011 ¹⁷ ; Gregg, 2005 ¹⁹ ; Higgins, 2004 ²² ; Iizuka, 2013 ²⁶ ; Liang, 2004 ²⁹ ; Weinstein, 2009 ⁴⁹	USA (California, Indiana, Mississippi, Oklahoma, Oregon, Texas, Virginia, Wisconsin)	Mississippi tort reform legislation, jury award caps, caps of non-economic damages, damage award reforms, limitations of non-economic damage awards	Applying a limit on noneconomic damages, such as pain and suffering, applicable to most medical negligence cases, which may be adjusted annually for inflation. The reported capped award range from \$250,000 to \$750,000.	any medical malpractice, obstetrics, birth-related injury	Data regarding lawsuits against physicians insured by the Medical Assurance Company of Mississippi (MACM) was collected and found that the number of MACM-insured Physicians increased in Mississippi after the implementation of tort reform. Although tort reforms (particularly the limit on noneconomic damages and

					<p>pursuit notice) reportedly have enabled MACM to resolve some claims more easily, these reforms have also significantly reduced the frequency of both claims and lawsuits.³⁴</p> <p>Using Nationwide Inpatient Sample (NIS) the results for Caps on non-economic damages (CapsNED) were mixed and not necessarily consistent with the predicted impact. For example, in only one case were CapsNED associated with a higher probability of medical errors. However, these comparisons are only suggestive because many factors, including state fixed-effects, are not yet controlled.²⁶</p>
lizuka, 2013 ²⁶ , Domin, 2004 ¹⁵	USA	caps on punitive damages (CapsPD), elimination of punitive damages	Punitive damages are awarded to punish a defendant for intentional or malicious misconduct. Although these damages are infrequently awarded, they can be very large when granted. Punitive damage reform places a cap on these damages	Birth trauma injury to neonate; obstetric trauma to mother (vaginal delivery with instrument); obstetric trauma to mother (vaginal delivery without instrument); obstetric trauma to mother (caesarean delivery)	Using Nationwide Inpatient Sample (NIS) and information on state tort reform (the second data set) revealed states with CapsPD have more medical errors than the states without these caps. ²⁶
Domin, 2004 ¹⁵ , Gregg, 2005 ¹⁹ , Higgins, 2004 ²² , lizuka, 2013 ²⁶	USA (Arizona, Kansas, Oklahoma)	abolition of the collateral source rule, collateral source rule (CSR) reform	The collateral source rule does not allow jury members to take into account any payments to a plaintiff other than those made by the defendant, which means that a plaintiff can recover full damages from a defendant even after the plaintiff has been compensated from other sources, including the plaintiff's insurance or workers compensation. Elimination of such rule will allow admission of outside benefits as	any medical malpractice, birth-related injury	Using Nationwide Inpatient Sample (NIS) and information on state tort reform (the second data set) revealed mixed results for collateral source reform and not necessarily consistent with the predicted impact. ²⁶

			evidence and may inform reductions of damage awards.		
Domin, 2004 ¹⁵ , Gregg, 2005 ¹⁹	USA (New York, Arizona)	Monetary Limitations on Plaintiff's Attorney Fees, sliding scale contingent fee systems	the statute might involve a graduated/sliding scale fee schedule that reduces the contingent fee as the award increases, or subject contingent fees to peer review	obstetrics, any medical malpractice	NR
Alternative Payment System and Liabilities					
Domin, 2004 ¹⁵ , Gilmour 2006 ³³	Canada, USA (California, Illinois)	Periodic Payments of Damages	Allows judges to order periodic payments of damages if the award exceeds a threshold (reported threshold ranged from \$50,000-\$250,000)	obstetrics, general	NR
Domin, 2004 ¹⁵	USA	experience-rated insurance	This insurance system, referred to as "experience rating," makes premiums directly dependent on the number of claims that have been brought against the insured individual. When applied to malpractice insurance, premiums increase according to the number of times a doctor is sued.	any medical malpractice	NR
Chen, 2010 ⁵³ , Gilmour 2006 ³³	USA	Enterprise Liability, Enterprise Insurance	Enterprise liability and enterprise insurance both propose to remove the locus of the responsibility for medical injuries from individual physicians to the larger institutional structure in which most modern medicine is practiced today. Where they differ is the attribution of liability. As their respective names indicate, enterprise liability would have hospitals, or other health care networks, be legally responsible for medical malpractice committed by physicians in their organizations. On the other hand, enterprise insurance leaves legal liability at the physician level, but requires hospitals or networks to provide insurance for negligent medical injuries to physicians under their umbrella. Enterprise liability, which would have hospitals (or other groups, such as networks, Health Maintenance Organizations, etc.) liable for the negligence of its affiliated medical	any medical malpractice, obstetrics, caesarean sections	NR

			personnel even in the absence of its own fault, rests on the doctrine of respondent superior.		
Higgins, 2004 ²² ; Iizuka, 2013 ²⁶	USA	Joint and Several Liability reform	Joint and several liability requires each liable party to be individually responsible for the entire obligation, regardless of his respective percentage of fault. Joint and several liability allows a plaintiff to seek damages from all, some, or only one of the parties alleged to have caused the injury. In many cases, a defendant can seek indemnification or reimbursement from unnamed parties. Joint and several liability allows plaintiffs the luxury of only needing to establish that one defendant is responsible for the injury, thereby obtaining a judgment against all defendants. The reform overturns this traditional rule to make doctors accountable for their own errors	any medical malpractice, birth trauma injury to neonate	Using Nationwide Inpatient Sample (NIS) and information on state tort reform (the second data set) revealed that states with JSL reform have fewer medical errors than states without the reform. ²⁶
Limitations on litigation					
Domin, 2004 ¹⁵	USA (California, Louisiana, New York)	Statute of Limitations	The statute of limitations provision requires the initiation of all medical malpractice actions within predefined time period from the date of the injury, regardless of when the injury was discovered. The statute may allow the time limit to be tolled only in cases of fraud, intentional concealment, or the presence of nontherapeutic and non-diagnostic foreign bodies.	any medical malpractice	NR
CMPA, 2005 ⁶ ; van Boom, 2007 ³¹	Canada, France	reform of French health law, Government indemnification with tort-based filter	A tort-based (fault-based) filter to limit the number of claims entering the system. In the case of French health law reform, children suffering from disability brought about by natural causes and undetected by negligent health care professionals can no longer claim non-pecuniary loss for the fact of living a disabled life.	perinatal injury, any medical malpractice	NR

Multi-component Model					
Bogue, 2013 ¹³ , Chow, 2006 ⁵² , Conroy, 2006 ¹⁴ , Gilmour 2006 ³³ , Hull, 2005 ²⁵ , Liang, 2004 ²⁹ , McAfee, 2005 ³⁰ ;	USA (California, Colorado, Massachusetts, Texas)	Massachusetts Health Care Cost Containment Bill of 2012, The Fair and Reliable Medical Justice Act of 2005 (i.e., health court model, caps on non-economic damages), The Health Act 2005, Health Care Availability Act, Medical Injury Compensation Reform Act (MICRA), Bush's proposed tort reform, limiting the size and risk of judgement, Texas Alliance for Patient Access (TAPA)	Varying combination of strategies, such as capped damages, apology law, abolition of collateral source rule, statute of limitations, limit on lawyer's contingency fees, allowance of periodic payments, pre-trial screening etc. under a comprehensive model, Act or Bill. Caps on non-economic damages is the most common strategy among these models.	any medical malpractice, obstetrics and emergency care	NR

Table 3. Interventions Related to Cerebral Palsy

Study	Type of Intervention	Intervention details
Leflar R. Symposium on Medical Malpractice and Compensation in Global Perspective Part II: the Law of Medical Misadventure in Japan. Chicago-Kent Law Review. 2012.	No-fault compensation program for a limited class of obstetrical injuries	A system by which hospitals can submit cases of questionable deaths to an independent review panel of outside experts. These experts conduct an autopsy, review the medical records, interview the participants in the patient's care, and compile a report for both the family and the hospital. The experts recount exactly what happened and what measures should be taken to prevent similar events in the future. A summary of the case, with names redacted, is made public and posted on the Internet.
Berkowitz RL, Hankins G, Waldman R, Montalto D, Moore K. A proposed model for managing cases of neurologically impaired infants. Obstet Gynecol. Mar 2009;113(3):683-686.	The Neurologically Impaired Program for New York State	<p>The program includes: (1) Admission to the program will include all children with severe, nonprogressive neurologic impairment, as defined by the entry criteria. (2) All cases accepted into the program are exempt from the tort system. (3) Cases in which negligence contributed to the poor outcome must be identified, and those who were involved must be educated and/or disciplined appropriately. A determination of negligence, however, will have no bearing on the degree of compensation awarded to the families of children accepted into the program. (4) Obstetric caregivers throughout the state should be continually educated about failures of care that can lead to neurologically impaired infants and know that the care they have rendered will be critically, but fairly, scrutinized whenever their patients deliver a brain-damaged child; The program has two components:</p> <p>A. Financial Support</p> <p>The program will provide life-long support for well-defined medical needs irrespective of financial status, over and above those services already paid for by Medicaid and other existing insurance programs; payments will be limited to medical and case management services rendered, and a fixed amount at the time of death, at which time payments would stop; there is no payment for "pain and suffering." Entry into the program will require evaluation and examination by a certified professional; those denied entry into the program will have access to an appeals mechanism. If the appeal fails, they will be eligible to use the tort system as currently constructed.</p>
Gurewitsch ED, Allen RH. Shoulder dystocia. Clin Perinatol. Sep 2007;34(3):365-385.	No-fault compensation programs	Concern has been raised over imbalances in the level of actual expertise between plaintiff and defense experts. In theory, if experts' qualifications and the content of their opinions could be validated by a community of peers (ie, similar experts in the field) who would substantiate and differentiate the strength of medical evidence behind the statements made and ensure consistency of opinions proffered by confirming the similarity (or lack thereof) between the medical details of different cases in which such testimony is provided, then justice would be better served because court members would be more assured of the generalizability of the facts on which these cases are argued and decided. The general intent of many of the proponents of peer review is to effectively "police our own" mainly outside the court system that is, to invoke the possibility of professional consequences (eg, loss of hospital

		<p>privileges, revocation of membership in professional societies, or dismissal from academic departments) for the expert witness whose testimony is found wanting by the panel of peer professionals reviewing it. Rather than attempting to sort out who is at fault, the victim should be entitled to compensation (at a preset level rather than left to be determined by individual jury panels) and should be guaranteed to receive such compensation based on the degree of injury and impairment suffered.</p>
<p>Capstick B. The future of clinical negligence litigation? BMJ. Feb 21 2004;328(7437):457-459.</p>	<p>Police reform</p>	<p>The proposed NHS redress scheme will provide an administrative rather than a judicial route for claims up to £30 000 (€43 640, \$54 420) and claims arising from severe neurological impairment related to birth. The redress scheme proposes that hospitals investigate all adverse events, not only in response to a complaint or claim by the patient. When an investigation shows that something has gone wrong, clinicians will have to disclose this to the patient or family. The next step for people who decide to pursue a smaller claim would be for the hospital to develop and deliver a package of remedial care. An expert panel will determine eligibility for compensation under the final component of the redress package for smaller claims. This is not a “no fault” scheme, and compensation will depend on some determination of fault. The compensation element of the proposed scheme for smaller claims is modelled on the “Resolve” scheme, which was piloted by the NHS Litigation Authority for six months beginning in January 2002. Claims valued at less than £15 000 were referred to the authority for determination of liability by a single expert. There were no defence legal costs, and claimants’ lawyers’ fees were capped at £1500. Additional fees were paid to the clinical expert and the scheme managers. More than 200 cases were enrolled. Involvement of clinicians implicated in the event was limited to the statement they normally make to their hospital when a claim arises. In addition to the scheme for smaller claims, many proposes the introduction of a separate scheme for compensating those who suffer severe, birth related, neurological impairment, including cerebral palsy. Claimants would not have to prove negligence or any other degree of fault to qualify for payment, but the requirement to prove that the injury was birth related could mean that many of the arguments about causation that currently occur in obstetric litigation would continue. Successful claimants could expect to receive up to £50 000 as an initial lump sum for pain and suffering, up to £50 000 as a lump sum for home adaptations, and up to £100 000 a year for additional care that the NHS may not be able to provide.</p>

Appendix 1. Search Strategy

WHO Malpractice – Medline Search Strategy (Literature Search performed: June 15, 2015)

1. Obstetrics/
2. "Obstetrics and Gynecology Department, Hospital"/
3. exp Obstetric Surgical Procedures/
4. obstetric\$.tw,hw.
5. exp Obstetric Labor Complications/
6. exp "Dilatation and Curettage"/
7. exp Hysterectomy/
8. Sterilization, Tubal/
9. Salpingostomy/
10. exp Pregnancy Complications/
11. cerebral palsy/
12. Asphyxia Neonatorum/
13. (abortion\$ or cervical cerclage or colpotomy or culdoscop\$ or fetoscop\$ or hysteroscop\$ or hysterotomy).tw.
14. (paracervical block\$ or obstetric\$ anesthe\$ or obstetric\$ anaesthe\$).tw.
15. (Cesarean or Episiotom\$ or obstetric\$ extraction\$ or fetal version).tw.
16. ((induc\$ or augmentation or premature or pre-term or preterm or obstructed) adj (labour or labor)).tw.
17. (Abruptio Placentae or breech or Cephalopelvic Disproportion or premature rupture of fetal membrane\$ or prom or fetal membranes premature rupture or Dystocia or Uterine Inertia or Chorioamnionitis or Placenta Accreta or Placenta Previa or Postpartum Hemorrhage or Uterine Inversion or Uterine Rupture or Vasa Previa).tw.
18. (Fetal Death or Fetal Resorption or Stillbirth or perinatal death or peri-natal death or Maternal Death or Birth Injuri\$ or obstetric\$ paralys\$).tw.
19. (pre-eclampsia or dilatation or Curettage or Vacuum aspiration).tw.
20. (asphyxia neonatorum or cerebral palsy or birth asphyxia or fetal pulmonary embolism or dystocia).tw.
21. exp Dystocia/ or exp Pregnancy Complications, Cardiovascular/
22. or/1-21
23. exp Medical Errors/
24. ae.fs.
25. (error\$ or advers\$ or mistake\$ or negligence).tw.
26. or/23-25
27. 22 and 26
28. exp Malpractice/
29. Expert Testimony/
30. (reforms or tort reform\$ or damage award limit\$ or lawsuit\$ or immunity provision\$).tw.
31. (immunity provision\$ or immunity clause\$ or fault compensation or Malpractice or expert witness\$).tw.
32. (statutes adj2 limitations).tw.
33. lj.fs.
34. exp Jurisprudence/
35. or/28-34
36. 27 and 35
37. limit 36 to yr=2004-current
38. limit 37 to english

Appendix 2. List of Included Reports

	Year	Reference
1.	2015	Santos P, Ritter GA, Hefele JL, Hendrich A, McCoy CK. Decreasing intrapartum malpractice: Targeting the most injurious neonatal adverse events. <i>Journal of Healthcare Risk Management</i> . 2015;34(4):20-27.
2.	2014	Milland M, Christoffersen J, Hedegaard M. Reply: The advantages of a centralized compensation system for handling obstetric injury claims. <i>Acta Obstetrica et Gynecologica Scandinavica</i> . 2014;93(4):430-431.
3.	2014	Pettker CM, Thung SF, Lipkind HS, et al. A comprehensive obstetric patient safety program reduces liability claims and payments. <i>American Journal of Obstetrics and Gynecology</i> . 2014;211(4):319-225.
4.	2013	Bogue K. Innovative Cost Control: An Analysis of Medical Malpractice Reform in Massachusetts <i>Journal of Health & Biomedical Law</i> . 2013:150-183.
5.	2013	Iizuka T. Does higher malpractice pressure deter medical errors? <i>Journal of Law and Economics</i> . 2013;56(1):161-188.
6.	2013	Milne JK, Walker DE, Vlahaki D. Reflections on the Canadian MORE(OB) obstetrical risk management programme. <i>Best Practice & Research Clinical Obstetrics & Gynaecology</i> . 2013;27(4):563-569.
7.	2012	Leflar R. Symposium on Medical Malpractice and Compensation in Global Perspective Part II: the Law of Medical Misadventure in Japan. <i>Chicago-Kent Law Review</i> . 2012;87(1).
8.	2012	Nazeer S, Shafi M. Never Events. <i>Obstetrics, Gynaecology and Reproductive Medicine</i> . 2012;22(5):135-137.
9.	2012	Pegalis SE, Bal BS. Closed medical negligence claims can drive patient safety and reduce litigation. <i>Clinical Orthopaedics and Related Research</i> . 2012;470(5):1398-1404.
10.	2011	Avraham R. Clinical practice guidelines: the warped incentives in the U.S. healthcare system. <i>American Journal of Law & Medicine</i> . 2011;37(1):7-40.
11.	2011	Behrens MA. Medical liability reform: a case study of Mississippi. <i>Obstetrics and Gynecology</i> . 2011;118(2 Pt 1):335-339.
12.	2011	Furrow B. The patient injury epidemic: medical malpractice litigation as a curative tool. <i>Drexel Law Review</i> . 2011;4(41).
13.	2011	Ho B, Liu E. "What's an Apology Worth? Decomposing the Effect of Apologies on Medical Malpractice Payments Using State Apology Laws". <i>Journal of Empirical Legal Studies</i> . December 2011;8(S1):177-199.
14.	2011	Leflar R. Public and Private Justice: Redressing Health Care Harm in Japan. <i>Drexel Law Review</i> . 2011;4(243):243-264.
15.	2011	Miller LA. Health courts: an alternative to traditional tort law. <i>Journal of Perinatal & Neonatal Nursing</i> . 2011;25(2):99-102.
16.	2010	Berkowitz RL, Montalto D. Tort reform: why is it so frequently unobtainable? <i>Obstetrics and Gynecology</i> . 2010;116(4):810-814.
17.	2010	Chen BK. Defensive medicine under enterprise insurance: do physicians practice defensive medicine, and can enterprise insurance mitigate its effect? 5th Annual Conference on Empirical Legal Studies Paper; July 7 2010; New Haven, Connecticut.
18.	2010	Edwards C. The Impact of a No-Fault Tort Reform on Physician decision-making: a look at Virginia's Birth Injury Program. <i>Revista Juridica Universidad de Puerto Rico</i> . 2010;80.
19.	2010	Strunk A, Queenan, J. Beyond Negligence Administrative Compensation for

		Adverse Medical Outcomes. <i>Obstetrics and Gynecology</i> . 2010;115(5):896-903.
20.	2009	Berkowitz RL, Hankins G, Waldman R, Montalto D, Moore K. A proposed model for managing cases of neurologically impaired infants. <i>Obstetrics and Gynecology</i> . 2009;113(3):683-686.
21.	2009	Hannah A. A Look Into the Magic Eight Ball: Would Health Courts Survive Judicial Scrutiny in Missouri? "Signs Point to Yes". <i>UMKC Law Review</i> . 2009;77.
22.	2009	Huang H, Soleimani F. "What Happened to No-Fault? The Role of Error Reporting in Healthcare Reform". <i>Houston Journal of Health Law & Policy</i> . 2009;1(34).
23.	2009	Weinstein SL. Medical Liability Reform Crisis 2008. <i>Clinical Orthopaedics and Related Research</i> . 2009;467(2):392-401.
24.	2008	Holbrook J. Negotiating, mediating, and arbitrating Physician-Patient Conflicts. <i>Clin Obstet Gynecol</i> . 2008;51(4):719-730.
25.	2007	Chow E. Health courts: an extreme makeover of medical malpractice with potentially fatal complications. <i>Yale Journal of Health Policy Law and Ethics</i> . 2007;7(2):387-427.
26.	2007	Geckeler G. "The Clinton-Obama Approach to Medical Malpractice Reform: Reviving the Most Meaningful Features of Alternative Dispute Resolution". <i>Pepperdine Dispute Resolution Law Journal</i> . 2007;8(1).
27.	2007	Gurewitsch ED, Allen RH. Shoulder dystocia. <i>Clinics in Perinatology</i> . 2007;34(3):365-385.
28.	2007	Hedrick V. "The Medical Malpractice Crisis: Bandaging Oregon's Wounded System and Protecting Physicians". <i>Willamette Law Review</i> . 2007.
29.	2007	van Boom W, Pinna A. "Shifts from Liability to Solidarity: The Example of Compensation of Birth Defects". <i>Springer, Vienna</i> . 2007.
30.	2007	Winn SH. Assessing and credentialing standards of care: the UK Clinical Negligence Scheme for Trusts (CNST, Maternity). <i>Best Practice & Research Clinical Obstetrics & Gynaecology</i> . 2007;21(4):537-555.
31.	2006	Conroy AD. Lessons learned from the "laboratories of democracy": a critique of federal medical liability reform. <i>Cornell Law Review</i> . 2006;91(5):1159-1202.
32.	2006	Gilmour J. "Patient Safety, Medical Error and Tort Law: an International Comparison". May 2006.
33.	2006	Pearlman MD. Patient safety in obstetrics and gynecology: an agenda for the future. <i>Obstetrics & Gynecology</i> . 2006;108(5):1266-1271.
34.	2006	Yee F. "Mandatory Mediation: the Extra Dose Needed to Cure the Medical Malpractice Crisis". <i>Cardozo Journal of Conflict Resolution</i> . 2006;7:393.
35.	2005	Bovbjerg RR. Malpractice crisis and reform. <i>Clinics in Perinatology</i> . 2005;32(1):203-233.
36.	2005	Gregg C. "The Medical Malpractice Crisis: A Problem with No Answer?". <i>Missouri Law Review</i> . 2005;70(1).
37.	2005	Hull M, Cooper RB, Bailey CW, Wilcox DP, Gadberry GJ, Wallach M. "House Bill 4 and Proposition 12: An Analysis with Legislative History, Part One: Background and Overview". <i>Texas Tech Law Review</i> . 2005;36(1).
38.	2005	McAfee J. "Medical Malpractice Crisis Factional or Fictional?: an Overview of the GAO Report as interpreted by the Proponents and Opponents of Tort Reform". <i>Journal of Medicine and Law</i> . 2005;9(161).
39.	2005	The Canadian Medical Protective Association (CMPA). <i>Medical liability practices in Canada: towards the right balance</i> . August 2005.
40.	2004	Capstick B. The future of clinical negligence litigation? <i>The BMJ</i> . 2004;328(7437):457-459.

41.	2004	Domin S. "Where Have All the Baby-Doctors Gone? Women's Access to Healthcare in Jeopardy: Obstetrics and the Medical Malpractice Insurance Crisis". <i>Catholic University Law Review</i> . 2004;53:499.
42.	2004	Higgins J. Recent Developments in Oklahoma Law: Oklahoma's Tort Reform Act: Texas-Style Tort Reform or Texas-Size Compromise? <i>Oklahoma Law Review</i> . 2004;57:921.
43.	2004	Liang BA, Ren L. Medical liability insurance and damage caps: getting beyond band aids to substantive systems treatment to improve quality and safety in healthcare. <i>American Journal of Law & Medicine</i> . 2004;30(4):501-541.

Appendix 3. Strategies Description

First Author, Year	Setting	Short name of the strategy	Program/Model/Policy description	Type of adverse event
No Fault Approach				
Berkowitz, 2009 ³⁵	New York, USA	no-fault compensation scheme	<p>Neurologically Impaired Program for New York State: (1) Admission to the program will include all children with severe, non-progressive neurologic impairment, as defined by the entry criteria. (2) All cases accepted into the program are exempt from the tort system. (3) Cases in which negligence contributed to the poor outcome must be identified, and those who were involved must be educated and/or disciplined appropriately. A determination of negligence, however, will have no bearing on the degree of compensation awarded to the families of children accepted into the program. (4) Obstetric caregivers throughout the state should be continually educated about failures of care that can lead to neurologically impaired infants and know that the care they have rendered will be critically, but fairly, scrutinized whenever their patients deliver a brain-damaged child.</p> <p>A. Financial Support The program will provide life-long support for well-defined medical needs irrespective of financial status, over and above those services already paid for by Medicaid and other existing insurance programs; payments will be limited to medical and case management services rendered, and a fixed amount at the time of death, at which time payments would stop; there is no payment for "pain and suffering." Entry into the program will require evaluation and examination by a certified professional; those denied entry into the program will have access to an appeals mechanism. If the appeal fails, they will be eligible to use the tort system as currently constructed.</p>	
Bovbjerg, 2005 ³⁷	USA	administrative compensation model	The best known non-tort model for addressing medical injuries is an administrative compensation system that pays claimants for defined, medically caused harms; it is not based on fault. Such models are meant to simplify determinations of responsibility for paying compensation, limit damage allowances, and reduce the reliance on adversary judicial process.	birth-related neurologic injuries
Chen, 2010 ⁵³	USA	no-fault liability	Ability to compensate victims of medical errors on a <i>no-fault basis</i> while avoiding the high cost of litigation.	general obstetrics, caesarean sections
CMPA, 2005 ⁶	Canada	no-fault compensation system	Under a pure no fault system, a "suitable" level of compensation would need to be determined, likely through the creation of a standard indemnification table.	general
CMPA, 2005 ⁶	Canada	combination tort and no-fault system	A no fault option for persons suffering "significant avoidable health care injuries." Access to the tort system would remain in place for those and all other victims. This change from the fault-based nature	general

			of the current system to “avoidable” would reduce the filter and would therefore allow more claims into the system.	
CMPA, 2005 ⁶	Canada	severely compromised infant program	Alternatives for managing birth-related neurological injury compensation. This scenario explores two alternatives for managing birth-related neurological injury compensation. In the first alternative, all “severely compromised” infant cases would be compensated at the same level as the current tort system. In the second alternative, which would be more similar in its functioning to the NICA program in Florida, significantly compromised infant cases would be indemnified at a level that covers all reasonable expenses for the life of the victim. In both options, all cases not related to severely compromised infants would continue to flow through the tort-based system that is in place today.	general
Domin, 2004 ¹⁵	Virginia, USA	No-fault compensation	<p>Virginia Birth-Related Neurological Injury Compensation Act: the Act was designed to accomplish this goal by removing the most catastrophic injuries from the tort system, thereby limiting most of the risk associated with the coverage of obstetrics. These debilitating injuries, commonly referred to as “birth-related neurological injuries,” are specifically described in the Act’s very narrow definition. The Act is funded through the \$5,000 annual fee required of participating obstetricians, a \$250 annual fee from non-participating obstetricians, and a \$50 per live birth fee from all hospitals. Despite the imposition of these fees, the Act negates the need to hire an “expert witness” for claim review because it provides for a three-doctor panel appointed by the deans of Virginia’s medical schools. This panel determines whether the statute covers the injuries in a particular case. A State medical licensing board reviews each claim covered by the Act to evaluate physician competence and standards of care, thereby weeding out “bad apples” and improving doctor performance. Compensation under the Act includes actual damages such as medical expenses, rehabilitation, and residential and custodial care. This also includes the purchase and use of special equipment and injury-related travel expenses.</p> <p>The Act includes a provision for loss of wages in the amount of 50% of the average state wage. However, the Act does not compensate plaintiffs for any pain and suffering, which means that patients seeking these damages likely will still sue in tort, where such damages are permitted. In order to pass constitutional muster, the Act allows for a civil action where “clear and convincing” evidence demonstrates that the physician or hospital willfully caused or intended to cause a birth-related neurological injury.</p>	obstetrics
Domin, 2004 ¹⁵	Florida, USA	No-fault compensation	<p>Florida’s Birth-Related Neurological Injury Compensation Act: modeled after the strict liability worker’s compensation plans, under which a claimant does not need to establish fault and the claim is handled administratively rather than legally. NICA focuses on birth-</p>	obstetrics

			related neurological injury, which according to the statute's definition, only refers to a narrow class of injuries. Notably, this already narrow definition only applies to those infants born alive and those over a certain minimum birth weight, thereby further restricting the statute's applicability and encouraging legal action only for serious injuries resulting in death. NICA limits compensation for injuries to \$100,000 plus actual expenses for certain medically reasonable bills related to the infant's medical care, rehabilitative care, training, and custodial care. Considering that the average jury award in cases of neurologically injured infants is nearly \$1 million, this limit is relatively low. However, if the claimant is not successful and the infant's injuries are found to be non-compensable, he or she may pursue a remedy in tort. To receive the benefits of NICA, the statute requires every licensed physician in the state to pay a \$250 annual fee, with participating obstetricians paying \$5,000 per year.	
Edwards, 2010 ¹⁶	Virginia, USA	no-fault insurance	Virginia Birth-Related Neurological Injury Compensation Program (BIP) is a voluntary, no-fault insurance pool. It legally precludes lawsuits for certain neurological injuries against physicians that choose to pay a yearly fee. Instead, patients must seek compensation from the BIP pool, a process that imposes little burden on physicians. In contrast, physicians that do not pay the yearly fee can be sued for these neurological injuries. The program framers never sought to overhaul the tort system generally, but instead wished to coax insurance companies to cover additional obstetricians. Consequently, they removed the cases that cause the greatest uncertainty in malpractice awards in obstetrics: birth-related neurological injuries.	obstetrics
Gilmour, 2006 ³³	USA	no-fault administrative compensation	Replacing tort liability with administrative systems to determine compensation on a no-fault basis. Eligibility is determined administratively; benefits are paid as expenses accrue, and are secondary to other sources of compensation. Physician participation is voluntary; funding is raised by levies on hospitals and physicians; participating physicians pay higher levies.	obstetrics
Gilmour, 2006 ³³	USA	The Institute of Medicine: Demonstration Projects	Testing no-fault systems for injury compensation: The aim was to develop systems that provided fair, reasonable, timely compensation for avoidable injuries to a greater number of patients, while stabilizing the malpractice insurance market by limiting health care providers' financial exposure. Two administrative models were proposed: (1) Provider-based early payment, with limits on damages for self-insured or experience-rated provider groups that agreed to identify and promptly compensate patients for avoidable injuries, with state-set limits on compensation for pain and suffering, and backed by federal re-insurance; and (2) Statewide administrative resolution: States would grant all health care providers immunity from most tort liability in exchange for	general

			mandatory participation in a state-sponsored administrative system to compensate patients for avoidable injuries.	
Gilmour, 2006 ³³	USA	no-fault administrative systems	Alternative to the current fault-based system. The threshold for eligibility for compensation proposed would be avoidability of the injury, rather than negligence. Eligibility would be determined through administrative procedures; some proposals incorporate schedules of compensable injuries and events, and/or determination by specialized panels as well. Administrative systems are compatible with enterprise liability, and can include provisions to encourage injury prevention, such as experience-rated contributions to the compensation fund and incentives for reporting error. Supporters recognize that, in order to ensure that "no-fault" does not mean no accountability, systems to ensure ongoing provider competence and quality would have to be revised and strengthened as well	general
Gilmour, 2006 ³³	New Zealand	accident compensation system (<i>no-tort compensation</i>)	As originally enacted, the accident compensation system provided compensation for victims of "personal injury by accident". Although an individual cannot sue if there is coverage under the ACC scheme, he or she does have a right to compensation in accordance with the terms of the statute once cover is established. Claimants are entitled to compensation if they have suffered "personal injury caused by treatment", i.e. a "treatment injury". "Treatment" is defined broadly. There is no requirement that the injury meet any threshold of severity. However, a causal link must still be established: cover is available for personal injury suffered by a person seeking treatment from a registered health professional that is caused by treatment. The fact that a treatment did not achieve a desired result does not in itself constitute a treatment injury.	general
Gregg, 2005 ¹⁹	USA	No-fault insurance	Under a no-fault approach, patients who are injured as a result of medical treatment receive compensation for their injuries without a determination of whether the doctor negligently caused the injury. Under such a system, the savings are derived predominantly by eliminating the expensive litigation system under which the largest costs are incurred. The savings can then be funneled toward treatment of patients' injuries. Thus, more injured plaintiffs receive compensation for their injuries, eliminating the current system's problem of leaving so many injured patients uncompensated. Plaintiffs do not have to undergo the extensive, exhaustive process of litigation and thus receive "faster, more efficient compensation." Additionally, doctors are not stigmatized because there is no determination of negligence against them. Most no-fault theories further suggest an enterprise liability system whereby the hospital is responsible for the no-fault premiums. Under this theory, hospitals will enact guidelines to ensure patient safety because the hospitals will pay for the costs of negligent care.	any medical malpractice

Gurewitsch, 2007 ³⁹	USA	no-fault compensation programs	Rather than attempting to sort out who is at fault, the victim should be entitled to compensation (at a pre-set level rather than left to be determined by individual jury panels) and should be guaranteed to receive such compensation based on the degree of injury and impairment suffered.	obstetrics
Huang, 2009 ²⁴	USA	No-fault system	In a basic no-fault system, administrators create a predetermined set of compensable medical events that result in injuries (often called designated compensable events, or DCEs) along with a fixed schedule of damages, both economic and noneconomic. An administrative system then handles patient claims and resolves factual disputes, without officially penalizing physicians.	obstetrics and vaccines
Leflar, 2011 ²⁷	Japan	No-fault compensation	The obstetrical injury no-fault compensation system has been launched in 2009. The system is administered by the quasi-public Japan Council for Quality Health Care. It is financed by a levy of [yen] 30,000 (US \$375) on each birth in Japan, ultimately paid by the social insurance system to private insurance companies that cover the liability for compensation payments. Parents of severely injured children who meet the rather strict requirements for compensation receive a standard one-time payment of [yen] 6 million (US \$75,000) plus [yen] 24 million (US \$300,000) paid out over the first twenty years of the child's life. The system is voluntary-no childbirth facility is required to participate, although virtually all of them do. Parents' legal right to sue for birth-related injuries on theories of negligence and breach of contract remains unchanged. No legislation was needed, therefore, to launch the new system; it merely required a Cabinet Order to fund it.	obstetrics
Leflar, 2012 ²⁸	Japan	No-fault compensation	The system is modeled in some respects on Florida's neurological injury compensation system. It is administered by the quasi-public Japan Council for Quality Health Care (JCQHC), and is financed through a fixed per-birth levy from the social insurance system paid to private insurance companies that stand to reap profits (or possibly suffer losses) from the system's operation. The system's stated goals are to provide prompt compensation, without the need for legal proceedings, to parents of infants suffering cerebral palsy related to brain injuries during childbirth, and to improve the quality of maternal care and prevent future cases. Of particular note, Japan's obstetrical injury compensation system was instituted in a manner that required no legislation. It is a voluntary system - no childbirth facility is obligated to participate. It is operated outside of government by JCQHC. Social insurance funds finance the system, and no specific legislative appropriation is needed. Parents still have a right to sue medical providers for negligence, as before the system was instituted.	obstetrics
Milland, 2014 ⁵¹	Denmark	centralized compensation system	The Danish Patient Insurance Act covers any patient who has received treatment within the public or private healthcare system in Denmark. The Danish Patient Insurance Association has existed	Obstetrics

			since 1992 and operates on a no-fault, no-blame basis. This entails the patient being compensated even though there is no identifiable fault (the endurance rule), and the individual practitioner not being held legally accountable, even though there has been an identifiable fault (the specialist rule). No-fault compensation is based on the ethical principle of redistributive justice, sometimes also called reciprocity. The principle is that a person harmed while receiving health care, should in turn be helped by the community."	
Miller, 2011 ⁴¹	Florida & Virginia, USA	no-fault compensation scheme	Award compensation to a defined group of infants who have birth-related injuries. Compensation is based on a link between the outcome and the birth process, not on negligence elements as in tort law. Although there are differences between the programs, both programs share common concepts and requirements: participation of physicians, nurses, and hospitals is voluntary and fee-based; the programs cover medical expenses and legal fees for qualified infants; and they require notice to patients of participation. Both the Birth-Related Neurological Injury Compensation Act (NICA) and Virginia Birth-Related Neurological Injury Compensation Program (BIP) include a medical review panel and are limited to infants born in a hospital and born alive (NICA has additional birth weight requirements) with injuries caused by oxygen deprivation or mechanical injury. Specifically, the injury must involve the infant's brain or spinal cord, effectively excluding shoulder dystocia cases with Erb's palsy and no cognitive impairment	Obstetrics
Strunk, 2010 ⁴⁸	USA	birth injury compensation funds	Birth Injury Compensation: an administrative claim must be made in administrative court. Should the plaintiff initiate a civil court action before eligibility for admission to the birth injury program is determined, the defendant physician or hospital or both will move to suspend or abate the civil proceeding pending a determination on admission to the program. Such motions are routinely granted in both states. After an administrative claim is made, medical records are reviewed by experts. Florida utilizes two staff and two outside experts. Typically, the experts are a maternal-fetal medicine specialist and a pediatric neurologist; they are paid by NICA for their services; once admitted to the program, a lifetime of care is provided. There is no cap on costs; "medically-necessary" treatment is the only limitation. Eligibility in most cases is decided within 6 months and "fault" or "negligence" plays no part in determining benefits. The administrative plans allow more money to be spent on care and less on attorneys; Funding of the programs is entirely private.	obstetrics
Strunk, 2010 ⁴⁸	Denmark and Sweden	administrative compensation	Administrative compensation: separate patient compensation from complaints. In essence, complaints reflect adverse outcomes resulting from avoidable injury, negligence, or medical error without negligence. In Denmark, compensation is based on a tax-paid system administered at the county level. The county, deemed the	obstetrics

			health care provider, takes out insurance from a Patient Insurance Association. Sweden requires individual health care providers to purchase patient insurance. Insurers who issue patient insurance are affiliated with a Patient Insurance Association. If a Swedish health care provider has not purchased the required insurance, the Patient Insurance Association will investigate and compensate the injury. Reimbursement of paid compensation will then be claimed from the caregiver. Sweden defines a compensable event in terms of avoidable injury, one which an experienced physician (general practitioner or specialist) could have avoided. If a procedure-related injury, a determination is made whether the procedure was performed properly and whether some other procedure could have satisfied the medical requirements in a less risky manner. In Denmark, the compensable event includes all avoidable, and some unavoidable, injuries. In both countries, fault or negligence is no longer a condition for receiving compensation (damages).	
van Boom, 2007 ³¹	New Zealand	no fault compensation scheme	With this rather radical amendment, the New Zealand compensation scheme has shifted away from attribution of medical injury towards a compensation mechanism that seems to filter out questions of fault and substandard care. In the new scheme, injury is compensated if caused by treatment (including diagnosis, consent issues, equipment used, etc.) and is “not a necessary part, or ordinary consequence, of the treatment, taking into account all the circumstances of the treatment”, including the patients’ underlying condition, and clinical knowledge at the time of treatment. Treatment injury does not include injury solely caused by resource allocation decisions.	perinatal injury, error, negligence
van Boom, 2007 ³¹	Virginia, USA	no-fault compensation scheme	Virginia Birth-Related Neurological Injury Compensation Program (BIP): by delivering a baby in a hospital that participates in the Program, the expecting parents automatically waive the right to file claims in a civil court for injuries sustained during delivery. If the child suffers neurological injury during birth (e.g., brain damage by asphyxia), then the Program applies. Compensation for the negligent misdiagnosis of genetic defects is outside the Program. There is, however, the complication of assessing the causal relationship between birth complications and the neurological injury. In some cases the Program has to work with presumed rather than proved causation, leaving it vulnerable to “leakage” into the Program.	perinatal injury, error, negligence
van Boom, 2007 ³¹	Florida, USA	no-fault compensation scheme	Birth-Related Neurological Injury Compensation Act (NICA): NICA covers birth-related neurological injury, i.e., injury to the brain or spinal cord of a live infant weighing at least 2,500 grams at birth. The injury must be caused by oxygen deprivation or by mechanical cause, in the course of labor, delivery or immediately after delivery. The infant must be permanently and substantially mentally and physically impaired.	birth-related neurological injury

van Boom, 2007 ³¹	Germany	specific trust fund	In Germany, the injuries caused by the drug Kontergan (also known under the name of Softenon, Diethylstilbestrol) prompted the legislature to establish a specific trust fund. This trust provides periodic and fixed compensation, reflecting the percentage of disability. The payments are free from income tax and are not reduced by other social security arrangements. By providing this ad hoc compensation for an urgent and immediate societal problem, governments can sometimes meet the most pressing needs of important pressure groups.	perinatal injury, error, negligence
van Boom, 2007 ³¹	UK	redress scheme	The Chief Medical Officer recommends that a specific redress scheme for newborns with neurological birth defects be put in place. The suggested scheme would apply to severe neurological injury related to or resulting from birth; the care package and compensation would be based on a "severity index". Genetic or congenital defects would be excluded from the scheme. The proposed scheme would comprise a managed care package, reimbursement of excess cost, adaptations, and a lump sum payment for non-pecuniary loss of £ 50,000 (€ 72,000).	birth-related neurological injury
Safety Program and Practice Guidelines				
Avraham, 2011 ¹²	USA	Private Regulation Regime (PRR)	<p>PRR would consist of private firms competing to provide evidence-based medical guidelines that offer liability protection to complying doctors.</p> <ul style="list-style-type: none"> - Evaluate guidelines from the ex-ante perspective: The ex-ante perspective would take into account all potential beneficiaries, not just the specific plaintiff in front of the court. Because the firms will know that they will be subject to review from the ex-ante perspective, and thus from all potential angles, they will develop guidelines that are efficient, impartial, and reliable. - Recognize Contractually Standardized Care (and reimbursement): Contracts between payers and providers could link reimbursements to the optimal level of safety and cost-effectiveness. If a provider uses guidelines that are too cautious, the provider would receive a smaller reimbursement for its services. If reimbursements were thus linked to guidelines, providers would demand optimal guidelines when they purchase them from private firms. In this way, the private firms would be incentivized through liability to produce safe guidelines, and through their customers to provide efficient guidelines - Recognize a new legal doctrine called the Private Regulatory Compliance Defense: Regardless of the consequences of a procedure, if the doctor follows her guidelines she will not face malpractice liability. The defense would not apply, however, to doctors who do not purchase or license guidelines or who deviate from their instructions. Unlike the doctrines of statutory or regulatory compliance, which attach evidentiary weight to the fact that a statute or regulation is followed, the private-regulatory 	any medical malpractice and adverse event

			<p>compliance defense would have to be a complete defense</p> <ul style="list-style-type: none"> - Provide intellectual property protection for medical procedures - Not recognize the state-of-the-art defense--at least as it would apply to guidelines or medical practice - Impose solvency requirements on the private firms that would be producing the guidelines 	
Milne, 2013 ⁴²	Canada	Managing Obstetrical Risk Efficiently (MORE)	<p>The MORE Programme consists of three educational modules, each about 12 months in length: 'Learning together', 'Working together' and 'Changing culture'. The modules teach core obstetric content to ensure all members of an obstetric unit (e.g., nurses, midwives, family physicians, and obstetricians) have a similar foundation of clinical knowledge. Learning activities focus on establishing characteristics of high-reliability organisations within obstetric units, such as, safety being the first priority and everyone's responsibility, teamwork, communication and risk-management proficiency. The program is delivered partly on site and partly on-line, and uses a 'train the trainer' structure. A hospital-selected multidisciplinary healthcare practitioner team is first trained by MORE facilitators and then supported by program consultants. The end goal for the program was to change the culture of blame to a culture of patient safety.</p>	Obstetrics
Nazeer, 2012 ⁴³	UK	"never events" list and guidelines	<p>The National Patient Safety Agency (NPSA) has compiled a list of 'never events' with the aim of raising awareness of such incidents. By officially publishing a list of such events, their importance is emphasized and brought to the attention of all healthcare professionals. Moreover, it is vital to reflect and learn from their occurrence through proper reporting processes set in place. The long-term objective is to minimize the incidence of these life-threatening events and work towards an optimal patient-safe environment. Providers (hospitals) should immediately inform patients and/or their families that a serious incident has occurred according to the principles of the NPSA's 2009 'Being Open' policy, including offering appropriate support to patients/their families and the staff involved who may also be affected by the incident; providers must discuss a possible "never event" with their commissioners (the Primary Care Trusts, PCTs) and, through the NPSA, report to the Care Quality Commission (CQC) as part of their existing requirements to report Serious Incidents; providers should carry out an analysis of the underlying root causes of the event and discuss learning and preventative action with their commissioner, sharing any learning with the NPSA as appropriate; Commissioners and providers should discuss and, if appropriate, put in place arrangements for the commissioner to recover the costs of the procedure in which the "never event" occurred and any necessary treatment that results from this event; commissioners should publish the numbers and types of "never events" that have</p>	obstetrics

			been reported to them on an annual basis	
Pearlman, 2006 ⁴⁴	USA	Recommendations for Improved Patient Safety	Changes in four areas to specifically address patient safety in obstetrics: (1) Develop reliable and reproducible quality control measures for obstetrics and gynecology that go beyond measures such as caesarean delivery or vaginal birth after caesarean rates; (2) Support the establishment of closed claim reviews on a nationwide basis and incorporate the results into practice bulletins. Although closed claims reviews have been performed in obstetric and gynecologic settings, they most often have been undertaken regionally; (3) Create partnerships with the pharmaceutical and medical devices industries to develop safer drugs and equipment and to provide training for health care professionals in the safe use of complex new equipment (e.g., robotics); (4) Incorporate patient safety education into all levels of training as a requirement for initial and continued board certification— from undergraduate medical education, through residency and other postgraduate training programs, and continuing with a demonstration of both the understanding and practice of safest medical practice systems.	Obstetrics
Pegalis, 2012 ⁴⁵	USA	Patient safety guidelines	examining medical malpractice claims data to identify errors that proved amenable to patient safety guidelines and protocols that ultimately helped drive down the costs and incidence of medical malpractice litigation.	obstetrics
Pettker, 2014 ⁴⁶	USA	Obstetric safety program	(1) Outside Expert Review: we began in 2002 with a review of our obstetric services by 2 independent consultants. This site visit culminated in recommendations that focused on principles of patient safety, evidence based practice and consistency with standards of professional and regulatory bodies; (2) Protocols and Guidelines: protocol and guideline development began in 2004 with the aim to codify and standardize existing practices. Over 40 documents were produced during the study period; (3) Obstetric Safety Nurse: an obstetric safety nurse was hired in 2004 to facilitate planned interventions and assist in data collection; (3) The nurse was in charge of educational efforts— including team training and electronic fetal heart rate (FHR) monitoring certification—and operations relating to patient safety activities; (4) Anonymous Event Reporting: we initiated in July 2004 a computerized and anonymous event reporting tool (Peminic Inc., Princeton, NJ) that allows any member of the hospital to report an event or condition leading to harm (or potential harm) to a patient or visitor. Reports were reviewed and investigated; (5) Obstetric Hospitalists: resident supervision and leadership of the inpatient activities was assumed by our Maternal-Fetal Medicine team to provide 24-hour, 7-day a week in-house coverage, beginning in 2003; (6) Obstetric Patient Safety Committee: established in 2004 this multidisciplinary committee of physicians, midwives, nurses, and administrators provides quality assurance and improvement	obstetrics

			oversight. In particular, this group met monthly to review adverse events and address the needs for protocols and policies; (7) Safety Attitude Questionnaire: to assess employee perception of teamwork and safety, we annually surveyed our teams with this tool, adapted from the aviation field; (8) Team Training: we implemented crew resource management seminars, based on those of airline and defense industries. These 4-hour classes included videos, lectures, and role-playing with the goal of integrating obstetric staffing silos (physicians, midwives, nurses, administrators, and assistants) and teaching effective communication. Completion of the seminar was a condition for employment and/or clinical privileges; (9) Electronic FHR Certification: teaching for this included dissemination and review of NICHD guidelines, review of tracings, allocation of study guides, and voluntary review sessions, culminating in a standardized, certified examination. All medical staff and employees responsible for FHR monitoring interpretation were obligated to pass this exam at program inception or within 1 year of employment.	
Santos, 2015 ⁴⁷	USA	risk reduction labor and delivery model	A new multilevel integrated practice and coordinated communication model that consisted of 4 key components: instituting new practice bundles for non-reassuring fetal status and shoulder dystocia occurrences with training for physicians and nurses; standardizing and requiring documentation of these bundles; establishing an unintended event disclosure policy, process, and training; and providing rapid feedback to teams on the model's performance measures. These components were developed using the High Reliability Organization framework, which is a set of concepts that hospitals use to "radically reduce system failures and effectively respond when failures do occur."; High Reliability Organization framework, is a set of concepts that hospitals use to "radically reduce system failures and effectively respond when failures do occur"	obstetrics: labour and delivery events (shoulder dystocia and fetal distress)
Winn, 2007 ⁵⁰	UK	Clinical Negligence Scheme for Trusts	Clinical Negligence Scheme for Trusts provides NHS trusts with a set of risk management standards for maternity services. These standards are designed to act as a framework, bringing focus to the development and implementation of clinical governance, thereby improving patient care. The standards were grounded in areas of practice that were known to give rise to litigation. The standards cover a range of both reactive and proactive risk management systems and processes, and each standard is set at three levels. Level 1 requires the establishment of a basic risk management framework and the functioning of some systems at a basic level. Level 2 requires implementation of risk management systems and processes and integration into practice. Level 3 is more demanding and requires a high level of compliance with activities such as training, the audit of systems, and evidence of changes and	obstetric

			improvements made as a result. The areas and services included in the assessment are antenatal, intra-partum and postnatal services, midwifery-led care, obstetric anaesthetics and obstetric ultrasonography.	
Specialized Courts and Alternative Claim Resolution				
Capstick, 2004 ³⁸	UK	NHS redress scheme	The proposed NHS redress scheme will provide an administrative rather than a judicial route for claims up to £30 000 (€43 640, \$54 420) and claims arising from severe neurological impairment related to birth. The redress scheme proposes that hospitals investigate all adverse events, not only in response to a complaint or claim by the patient. When an investigation shows that something has gone wrong, clinicians will have to disclose this to the patient or family. The next step for people who decide to pursue a smaller claim would be for the hospital to develop and deliver a package of remedial care. An expert panel will determine eligibility for compensation under the final component of the redress package for smaller claims. This is not a “no fault” scheme, and compensation will depend on some determination of fault. The compensation element of the proposed scheme for smaller claims is modeled on the “Resolve” scheme, which was piloted by the NHS Litigation Authority for six months beginning in January 2002. Claims valued at less than £15 000 were referred to the authority for determination of liability by a single expert. There were no defense legal costs, and claimants’ lawyers’ fees were capped at £1500. Additional fees were paid to the clinical expert and the scheme managers. More than 200 cases were enrolled. Involvement of clinicians implicated in the event was limited to the statement they normally make to their hospital when a claim arises. In addition to the scheme for smaller claims, many proposes the introduction of a separate scheme for compensating those who suffer severe, birth related, neurological impairment, including cerebral palsy. Claimants would not have to prove negligence or any other degree of fault to qualify for payment, but the requirement to prove that the injury was birth related could mean that many of the arguments about causation that currently occur in obstetric litigation would continue. Successful claimants could expect to receive up to £50 000 as an initial lump sum for pain and suffering, up to £50 000 as a lump sum for home adaptations, and up to £100 000 a year for additional care that the NHS may not be able to provide.	general and obstetrical (claims arising from severe neurological impairment related to birth)
Furrow, 2011 ¹⁷	USA	special courts for small medical injuries	To foster the handling of more small adverse events would be to create health care small claims courts to allow compensation for claims that otherwise are never filed because of discovery and other litigation costs. The program is intended to be an alternative, rather than an exclusive, remedy, with injured patients free to pursue their claims in the traditional tort system. Such a system	any medical malpractice

			could proceed on affidavits with a lower threshold of proof of the "adverse event" to allow for swift compensation for smaller injuries that otherwise never receive compensation under the current system.	
Gilmour, 2006 ³³	UK	NHS redress bill	The Bill is aimed at lowering value claims and intends to reform the clinical negligence system, enabling patients with claims arising in connection with certain health services in England to receive redress without having to resort to the legal system. It would be funded by contributions from scheme members (primarily NHS Trusts), supplemented with funding from the Department of Health. It would be available for claims arising from hospital care and other listed qualifying services provided as part of the NHS. Incidents will be investigated by patient redress investigators, who are to comply with rules of natural justice, and whose practice will be monitored by the Healthcare Commission. It is anticipated that the NHSLA will be responsible for determining eligibility and managing financial compensation, although the scheme will be administered locally. The NHS is expected to <i>"put the problem right, regardless of fault"</i>	general
Gregg, 2005 ¹⁹	USA	screening panels	A panel often comprised of a lawyer, a physician, and a judge, determines the merits of a claim before it is filed in court. These panels are designed to eliminate meritless claims and their associated costs, to encourage settlement of meritorious claims, and to decrease malpractice insurance costs for doctors	any medical malpractice
Gurewitsch, 2007 ³⁹	USA	peer review of expert testimony	Concern has been raised over imbalances in the level of actual expertise between plaintiff and defense experts. In theory, if experts' qualifications and the content of their opinions could be validated by a community of peers (i.e., similar experts in the field) who would substantiate and differentiate the strength of medical evidence behind the statements made and ensure consistency of opinions proffered by confirming the similarity (or lack thereof) between the medical details of different cases in which such testimony is provided, then justice would be better served because court members would be more assured of the generalizability of the facts on which these cases are argued and decided. The general intent of many of the proponents of peer review is to effectively "police our own" mainly outside the court system that is, to invoke the possibility of professional consequences (e.g., loss of hospital privileges, revocation of membership in professional societies, or dismissal from academic departments) for the expert witness whose testimony is found wanting by the panel of peer professionals reviewing it	obstetrics
Hannah, 2009 ²⁰	USA	health court	Health courts are based on an administrative model and are designed to provide compensation for medical injuries. They have several important components. First, decisions regarding compensation would take place outside of a regular courtroom setting, without a jury, and with a judge who has specialized	any medical malpractice

			training in health court adjudication. State-appointed neutral experts, trained in the same field as the defendant physician, would guide the judge. Next, instead of the traditional negligence standard, an avoidability standard would be used. Under this standard, "claimants must show that the injury would not have occurred if best practices had been followed or an optimal system of care had been in place, but they need not show that care fell below the standard expected of a reasonable practitioner." At this point, the judge, guided by the state-appointed experts, would attempt to base compensation decisions upon ex ante determinations about the preventability of common medical mistakes instead of traditional ex post determinations. Once the claimant, with the assistance of an attorney, if needed, proved that the injury could have been avoided, the judge would award non-economic damages based on a schedule of benefits similar to worker's compensation cases while still taking into account the individual circumstances of each case.	
Hedrick, 2007 ²¹	Oregon, USA	Medical review & screening panel	A typical panel is comprised of a physician or other professional health care worker, a legal professional, and a lay member. The panel members craft findings regarding fault and sometimes damages on the basis of testimony and other evidence presented by the parties, using evidential rules more flexible than those used in formal court proceedings. Review of a panel decision is typically mandatory and conclusions reached are often admissible in a subsequent trial, should one be necessary	obstetrics and other medical malpractice
Holbrook, 2008 ⁴⁰	USA	arbitration	Arbitration is a court-like, private alternative to litigation. In arbitration, parties submit a dispute to a neutral person called an "arbitrator" (or sometimes a panel of 3 arbitrators) to make a decision after an adversarial, evidentiary hearing (very much like a court trial without a jury). Arbitration can be either mandatory or voluntary, and binding or nonbinding. This article discusses the most common (and most controversial) type of arbitration called "mandatory binding arbitration" where parties are required to submit their dispute to arbitration and also are required to accept the arbitrator's decision.	Obstetrics
Leflar, 2011 ²⁷	Japan	health care specialty courts	Procedural reforms included setting and enforcing clearly delineated trial timelines with a concentrated evidence gathering process, and the expansion of a system for employment of judge-appointed expert witnesses. A key reform in judicial administration was the institution of health care divisions of district courts in several metropolitan areas with heavy civil caseloads. These divisions are staffed by regular career judges who serve in the health care divisions for assignments of typically three to five years. The goals of the system are speedy, well-informed, consistent adjudication. Notable features of the health care divisions include: (a) training for judges both in medical issues and in the efficient	obstetrics, general

			handling of medical cases; (b) the use of court-appointed experts; and (c) concentrated efforts at promoting settlements.	
Miller, 2011 ⁴¹	USA, Denmark, Sweden	administrative health courts	Denmark and Sweden use specialized claims handlers with experience related to the injury or field of medicine in question. These claims specialists gather information and decide whether the injury meets legally defined criteria for compensation. To do so, the handlers will consult with medical experts under contract with the company. The claims handler will then inform the patient of the decision. If the injury is found to be compensable in Sweden, the PFF pays the claim. In Denmark, the claim is paid by the county in which the injury occurred, under a program of self-insurance. Compensation consists of both economic and noneconomic damages, similar to the tort system in the United States, but both countries have limits on awards. Patients whose claims are rejected, or who are unhappy with the amount of the compensation awarded, may appeal the decision, initially to an appeals board and, if still unsatisfied, to the court system. In the United States, structure and administration vary among proposed models. Health court judges would be required to have specialized education and would be able to use court-appointed experts to explain clinical issues and provide evidence relating to the avoidability of the injury. Compensation would be provided in situations where the injury was deemed avoidable using a more likely than not standard. The health court's decision could be appealed, much like other administrative courts.	obstetrics
Communication and Resolution				
Bovbjerg, 2005 ³⁷	USA	disclosure plus patient safety	Greater disclosure of medical injuries to patients and their families has been proposed as a way to improve injury resolution under liability (or any other compensation system). It is supported as a matter of ethical obligation or good medical practice for enhancing patient-provider trust.	obstetrical
Furrow, 2011 ¹⁷	USA	mediation	Alternative Dispute Resolution (ADR) is often proposed as a way to avoid the claimed flaws of medical malpractice litigation. Mediation has been one of the most popular forms of ADR proposed. Newer risk-management approaches by some hospitals follow a transparency model where hospitals disclose adverse events to patients. Hospitals hold discussions with patients and their lawyers in a manner that resembles mediation, removing some of the hard-edged litigation negotiating that is more typical of medical malpractice cases.	obstetrics and other medical malpractice
Furrow, 2011 ¹⁷	USA	offer	Under this approach, providers would voluntarily agree to identify and promptly compensate patients for avoidable injuries. Damages would be limited under most proposals. Under the approach, the patient or provider would file the claim with the insurer when the adverse outcome first occurred. The insurer would then decide whether the injury was covered. If so, it would make a prompt	any medical malpractice

			payment. Disputes would be resolved through the courts or mediation. The proposed plan would include rate-insurance premiums paid by providers to incentivize providers to improve the quality of care by reducing their exposure to the listed adverse outcomes. The plan would also use provider experience to strengthen peer review within hospitals.	
Furrow, 2011 ¹⁷	USA	apology law	Potential release from liability offers doctors a powerful incentive to take responsibility for their mistakes and to share information about the nature of what went wrong.	any medical malpractice
Furrow, 2011 ¹⁷	USA	enterprise strict liability	Enterprise liability for an adverse medical event that doesn't require satisfaction of "unavoidability" or "unreasonable" criteria and without leaving the provider totally in control of whether to make an offer. If an adverse event occurs, it must be disclosed to the patient. Then, a provider may tender an early offer, perhaps coupled with mediation, to move the claims process forward rapidly with the plaintiff and the plaintiff's lawyer. If it is discovered that a reportable adverse event is not revealed, then the plaintiff is entitled to treble damages as an element of the damage claim. Procedural advantages, such as an extension of the statute of limitations, might also be considered.	any medical malpractice
Geckeler, 2007 ¹⁸	USA	MEDIC Act	This reporting and disclosure system would commence when a MEDiC program participant becomes aware of any medical error, n106 patient safety event, or notice of legal action related to the medical liability of that participant health care provider. Once aware of the notification event, the participant would be contractually required to fully disclose the suspected medical error, patient safety event, or pending legal action to the participant's designated patient safety officer. The designated patient safety officer must then complete a root cause analysis of the report. If the patient safety officer concludes that a patient was injured or harmed as a result of medical error or any breach of the relevant standard of care, the participant would be required to swiftly disclose the matter to the patient verbally, and submit a full, written disclosure to the patient. During the verbal disclosure to the patient, the bill directs the participant to initiate an offer to the affected patient to commence negotiations so that the patient can be presented with fair compensation for the adverse medical event. At this point, the patient must consent to an agreement for negotiations after first acknowledging: (1) the confidentiality of such negotiation proceedings; (2) that any "apology or expression of remorse" during the negotiation proceedings is both confidential and inadmissible in any "subsequent legal proceedings as an admission of guilt" if the negotiation proceedings fail to produce a mutually accepted settlement; and (3) that the patient does have a constitutional right to legal counsel. Additionally, both parties may elect to involve a "neutral third party mediator to facilitate" a	any medical malpractice

			settlement during the negotiation proceedings. The initial duration of the negotiations would be limited to a six-month period. As drafted, the bill allows for a onetime extension of three months if the initial negotiation period lapses and all parties to the negotiation request such an extension. If the parties do arrive at a mutually acceptable settlement, such an agreement would be deemed a final settlement, barring any further litigation with respect to such matters in federal or state court.	
Gilmour, 2006 ³³	Australia	open disclosure	The processes of open discussion of adverse events that result in unintended harm to a patient while receiving health care and the associated investigation and recommendations for improvement. The elements of open disclosure are an expression of regret, a factual explanation of what happened, the potential consequences of the event, and the steps being taken to manage the event and prevent its recurrence. This approach is consistent with the underlying premise that most adverse events in health care are the result of systems deficiencies and failures, and is also meant to assuage health care providers' concerns about participating. Organizations are directed to develop policies and practices to ensure that the open disclosure process focuses on safety and not attributing blame, and avoids adverse findings against individual professionals. Policies and procedures should take patients', carers', and staff privacy and confidentiality into consideration.	general
Hedrick, 2007 ²¹	Oregon, USA	apology statute	Oregon, along with twenty other states, has enacted a statute explicitly proclaiming that an apology or similar expression of sympathy offered by a physician to a patient following an adverse medical event may not be used as an admission of liability in a civil action. Author proposed amendment to the apology statute: (1) The ability of a person who is licensed by the Board of Medical Examiners to offer an expression of regret or apology, and the ability of any other person who makes an expression of regret or apology on behalf of a person who is licensed by the Board of Medical Examiners, shall not be interfered with; (2) The court shall fine any person or entity determined, by a preponderance of the evidence, to have interfered with the ability to offer an expression of regret or apology, as provided in Sections (1)-(3) above, not more than \$ 20,000 for each violation, which shall be entered as a judgment and paid to the Oregon Health Plan. Each violation is a separate offense. In the case of continuing violations, the maximum penalty shall not exceed \$ 200,000; (3) The court may award reasonable attorney fees to one licensed by the Board of Medical Examiners if he or she prevails in an action under this section.	any medical malpractice
Ho, 2011 ²³	USA	apology law	These laws state that apologies made by medical practitioners cannot be used as evidence in medical malpractice litigation. The laws are intended to protect statements of apology made by	general; obstetrics

			physicians in order to increase the likelihood of their use. Apology laws work by reducing the expected damage award that doctors face if the case goes to court. The reduced expected damage award leads to a lower expected settlement payment, which leads to lower monetary costs faced by doctors if they decide to apologize.	
Holbrook, 2008 ⁴⁰	USA	negotiation	Negotiation is the attempt of 2 (or more) persons to work together to come up with some mutually agreeable outcome, either by creating a deal or resolving a conflict. What makes negotiation so difficult to use for resolving this physician-patient conflict are the heightened emotions of both participants and their understandable desire to avoid a painful conversation about what happened and who is to blame. People in high-conflict situations typically create and tell stories, which present each speaker's one-sided perspective of what is "true." The benefit of such dysfunctional negotiation is to overcome avoidance by creating face time in which the parties can tell their conflict stories to one another. Agreeing to follow conversation protocol is helpful. Can use "distributive" negotiation, "integrative" negotiation, which focuses on the parties' self-interests and possible ways in which the parties might work together cooperatively to maximize their respective interests transformative" negotiation in which the parties seek opportunities for "empowerment" and "recognition	Obstetrics
Holbrook, 2008 ⁴⁰	USA	mediation	Mediation is simply facilitated negotiation in which the parties involved in conflict meet in the presence and with the assistance of an impartial third party called the mediator. The mediator is the host of a respectful problem-solving process. The mediator often is experienced in the subject matter of the dispute (here, the dispute involves the breakdown of communication between a physician and her patient that results in the patient's perception that she was harmed by her doctor whom she trusted for many years). The mediator structures the way the parties tell their conflict stories so as to productively manage the parties' expression of strong negative emotions. The mediator can help the parties focus on their self-interests and possible ways in which the parties might work together cooperatively to maximize their respective interests. The mediator can help the parties seek opportunities for empowerment and recognition. If appropriate, the mediator can help the parties either repair or end their relationship in a mutually respectful manner and bring closure to the conflict	Obstetrics
Strunk, 2010 ⁴⁸	USA	binding early offers of recovery	Binding Early Offers, allows the health care provider to determine whether an offer of recovery is made to an injured patient in a specific case. The offer guarantees periodic payment of the patient's net economic losses, including all medical expenses not covered by other sources, rehabilitation and lost wages, and an additional 10% for attorney's fees. The plan does not provide	obstetrics

			coverage for pain and suffering. The defendant's liability insurance company is the source of these monies. The plan does not rely on any public funds, nor does it depend on assessment or taxation of individual physicians or hospitals. It works like this: on the filing of a claim for damages, a health care provider would have 180 days within which to offer the guaranteed payments described above to the injured claimant. If the claimant declined a binding early offer in favor of litigation, the proposed statute would increase both the standard of misconduct and the burden of proof. In other words, rather than mere negligence, the plaintiff would be required to prove gross negligence. Instead of proof by a preponderance of the evidence, the standard might require clear and convincing evidence or proof beyond a reasonable doubt (the standard in criminal cases).	
Strunk, 2010 ⁴⁸	USA	nonbinding, voluntary administrative compensation	3Rs program: There are three basic tenets in the 3Rs Program. Recognize when an untoward event occurs and report it. Respond by telling the patient of the problem and its implications. Resolve by offering an apology, and, when appropriate, offer payments for out-of-pocket expenses not compensated by insurance (maximum \$25,000) and loss of time at a per diem of \$100 (maximum \$5,000). The program emphasizes prompt compensation. Negligence (fault) may or may not have caused the adverse medical outcome. If the patient involves a lawyer or initiates a written demand for payments, the 3Rs Program ceases.	obstetrics
Yee, 2006 ³²	USA	mediation	The most crucial difference between litigation and arbitration, on one hand, and mediation, on the other is the role of the impartial party. The arbitrator, like the judge or jury, is a decision-maker, whereas the mediator plays the role of settlement-facilitator. Thus, arbitration resembles a small trial and retains the rigidity of litigation. Mediation, on the other hand, deflects the focus of the dispute away from rights, winners, and losers. Instead, the parties create their own mutually acceptable resolution, and, if no resolution is found, they can simply walk away and pursue litigation. While preparing to mediate a medical malpractice dispute may be comparable to the pre-litigation preparation by trial attorneys, the goals of the litigation system clash with the goals of mediation. The goals of mediation include enhancing communication, focusing on the human side of a dispute, giving an opportunity for conciliation and restoration of relationships, allowing closure, an opportunity for healing, and an opportunity for a cost-effective and timely resolution. The paramount goal of medicine is consistent with the healing function of mediation. In contrast, litigation has absolutely nothing to do with healing.	any medical malpractice
Caps of Compensation & Attorney Fees				

Behrens, 2011 ³⁴	Mississippi, USA	Mississippi tort reform legislation	The core of House Bill was a \$500,000 limit on noneconomic damages, such as pain and suffering, applicable to most medical negligence cases. It also generally requires medical malpractice plaintiffs' attorneys to consult with an expert before filing suit, although "a complaint, otherwise properly filed, may not be dismissed, and need not be amended, simply because the plaintiff failed to attach a certificate or waiver." In addition, plaintiffs are required to give defendants 60 days' written notice before commencing a medical liability lawsuit, abolished joint liability for noneconomic damages for any defendant found to be less than 30% at fault, and provides heightened pleading requirements for cases involving medical professionals who prescribe prescription drugs.	obstetrical-gynecological
Berkowitz, 2010 ³⁶	USA	tort reform	In Texas a state constitutional amendment in 2003 capped total noneconomic damages in medical malpractice cases at \$750,000, with a \$250,000 cap for physicians (Proposition 12, non-economic damages reform, HB4, HJR 3). Other proposals have called for a fundamental restructuring of the existing tort system and have suggested the substitution of medical courts for trial by jury, ⁵ mandated mediation, or the institution of some form of "no-fault" insurance	obstetrics
Bovbjerg, 2005 ³⁷	USA	tort reform caps	The American Medical Association and numerous specialty societies promoted an administrative, but fault-based, system to resolve injuries better and also addressed a facet of medical quality but putting the same expert administrative agency in charge of medical discipline. The proposal did not feature a single flat cap, regardless of severity of injury, but rather a sliding scale that allowed larger amount of pain and suffering damages for more severe injury a fairer alternative that would make awards vary less widely than now.	obstetrical
Domin, 2004 ¹⁵	California, USA	jury award caps	Mandates a \$ 250,000 cap on noneconomic damages in cases where a verdict is returned against a physician or hospital for acts of malpractice. Noneconomic damages refer to those damages other than actual damages that include pain and suffering. Despite its revolutionary nature, this provision has withstood numerous constitutional challenges since its enactment.	obstetrics
Domin, 2004 ¹⁵	Virginia, USA	jury award caps	Virginia's jury award cap sets a limitation of \$ 1.7 million on recovery for medical malpractice that occurred on or after August 1, 1999	obstetrics
Domin, 2004 ¹⁵	Illinois, USA	Elimination of Punitive Damages	Illinois Medical Malpractice Reform Act: the Illinois legislature eliminated punitive damages in order to help address the rising cost of malpractice insurance premiums. The statute prohibits the recovery of punitive damages in medical or legal malpractice cases. The statute also prohibits exemplary, vindictive, and aggravated damages; therefore, obstetricians in Illinois are not threatened by lawsuits where costly punitive damages are at stake.	obstetrics

			The elimination of this threat should decrease risks of obstetric coverage, thereby helping to lower premiums.	
Domin, 2004 ¹⁵	New York, USA	Monetary Limitations on Plaintiff's Attorney Fees	The provision only targets contingent fees and has the greatest impact on the fees associated with larger jury awards. Specifically, the statute outlines a graduated fee schedule that reduces the contingent fee as the award increases.	obstetrics
Domin, 2004 ¹⁵	Arizona, USA	Monetary Limitations on Plaintiff's Attorney Fees	Arizona's version of an attorney fee limitation statute does not outline specific fee percentages, but instead legislates the right of any party in a medical malpractice action to review attorneys' fees. Upon such a request, the court shall determine the reasonableness of both parties' attorneys' fees, taking into consideration a variety of factors including the case's degree of difficulty, community standards for fees, and other work lost by the attorney as a result of the case.	obstetrics
Higgins, 2004 ²²	Oklahoma & Texas, USA	Caps On Noneconomic Damages	<p>The theory behind caps for noneconomic damages is that psychological losses for pain and suffering are not easily valued and often lead to excessive judgments. Moreover, those who support caps believe that juries are naturally biased against corporate defendants. A limit on the amount of noneconomic damages that can be awarded counterbalances those errors and biases.</p> <p>Oklahoma has enacted a "hard cap" of \$300,000 in all obstetrics-gynecology and emergency room cases; the Oklahoma reform has a controversial "soft cap" for all other cases. This soft cap applies only when the defendant has made a settlement offer and the ultimate jury award is one-and-one-half times greater than the final settlement offer. In addition, a judge who believes that a jury could find willful and wanton conduct supported by clear and convincing evidence has discretion to lift the cap. The practical application of this section, however, is extremely limited. First, the defendant must make an offer of settlement before the cap is applicable. Second, the jury has to return a verdict one-and-one-half times the settlement offer.</p> <p>In Texas, limits on noneconomic damages are dependent upon whether the defendant is a health care provider (physician) or a health care institution (hospital). The cap for noneconomic damages against one or more physicians is \$ 250,000. Likewise, the cap for one hospital is \$ 250,000. If a judgment is taken against more than one hospital, however, the limit for noneconomic damages for each separate hospital is \$250,000 per plaintiff and a combined limit of \$ 500,000 for all of the hospitals named in the suit.</p>	any medical malpractice
Liang, 2004 ²⁹	Wisconsin, USA	Non-economic damage cap	Wisconsin passed reform legislation in 1985 as a broad tort reform effort. Wisconsin adopted a \$ 350,000 non-economic damage cap, adjusted annually for inflation.	any medical malpractice
Furrow, 2011 ¹⁷	USA	Damage Award	The most powerful reform in actually reducing the size of	any medical

		Reforms	malpractice awards (and therefore the most unfair to plaintiffs) has been a dollar limit, or cap, on awards. Caps may take the form of a limit on the amount of recovery of general damages, typically pain and suffering, or a maximum recoverable per case including all damages	malpractice
Iizuka, 2013 ²⁶	USA	caps on non-economic damages (CapsNED)	Reforms concerning non-economic damages place a cap on the damages that can be awarded for non-economic losses, such as pain and suffering and emotional distress	Birth trauma injury to neonate; obstetric trauma to mother (vaginal delivery with instrument); obstetric trauma to mother (vaginal delivery without instrument); obstetric trauma to mother (caesarean delivery)
Iizuka, 2013 ²⁶	USA	caps on punitive damages (CapsPD)	Punitive damages are awarded to punish a defendant for intentional or malicious misconduct. Although these damages are infrequently awarded, they can be very large when granted. Punitive damage reform places a cap on these damages	Birth trauma injury to neonate; obstetric trauma to mother (vaginal delivery with instrument); obstetric trauma to mother (vaginal delivery without instrument); obstetric trauma to mother (caesarean delivery)
Gregg, 2005 ¹⁹	USA	Limitations on Non-economic Damage Awards	The most commonly adopted reform is a limitation on non-economic damages, such as pain and suffering. State legislatures enact caps to prevent the awards from getting out of control, citing examples in which juries have returned excessive pain and suffering awards. A cap adopted in many states sets the maximum for non-economic damages at \$ 250,000.	any medical malpractice
Gregg, 2005 ¹⁹	USA	Sliding Scale Contingent Fee Systems	Limiting attorney contingent fees	any medical malpractice
Liang, 2004 ²⁹	Indiana, USA	Tort reform	Indiana capped all malpractice damages at \$ 500,000 and eliminated all punitive damages. Indiana also created a "patient compensation fund" and a mandatory claim review board as alternative remedies to medical malpractice suits. Indiana courts have consistently upheld these tort reform provisions	any medical malpractice
Weinstein, 2009 ⁴⁹	Wisconsin, California, Oregon, Texas [USA]	cap on noneconomic damages	The primary solution to the medical liability reform crisis advocated by most physician groups and the fundamental tenet of federal legislation introduced thus far is the cap on noneconomic damages. Former CMS administrator Mark McClellan also noted a \$250,000 cap on noneconomic damages in malpractice lawsuits would have	NR

			a direct effect on malpractice premiums and would also have an effect on costs to consumers.	
Domin, 2004 ¹⁵	Arizona, USA	abolition of the collateral source rule	Arizona Medical Malpractice Act abolishes the collateral source rule, which requires that any evidence of outside benefits received by the injured, such as insurance payoffs, be excluded from trial; as well, it prohibits any reductions of damages based on such benefits.	any medical malpractice
Domin, 2004 ¹⁵	Kansas, USA	abolition of the collateral source rule	Kansas Statute, enacted in response to the medical malpractice crisis in that state, modified the traditional collateral source rule as it applied to medical malpractice cases, and aimed to reduce medical malpractice insurance premiums by lowering judgments in malpractice lawsuits. Differing slightly from the Arizona provision, the Kansas statute did not abolish the rule completely, but rather, admitted evidence of any reimbursement or indemnification received by the injured party, other than payments from such party's insurance company. Under the statute, a jury was not allowed to hear evidence that some services actually were paid for by insurance, but could hear evidence that a service was provided for free.	any medical malpractice
Gregg, 2005 ¹⁹	USA	Abrogation of the Collateral Source Rule	States have abrogated the collateral source rule by enacting legislation that either makes mandatory an offset for payment from collateral sources or permits the jury to consider the collateral source payment when determining a plaintiff's award.	any medical malpractice
Higgins, 2004 ²²	Oklahoma, USA	Reform to the Collateral Source Rule	Under the collateral source rule, compensation from other sources may not be admitted as evidence at trial. This common law rule prohibits the judgment to be offset by the amount paid to the plaintiff from collateral sources. Twenty-three states have reformed the collateral source rule, and most reforms allow the court to introduce collateral source payments into evidence, offset the judgment by the payments, or both.	any medical malpractice
Iizuka, 2013 ²⁶	USA	collateral source rule (CSR) reform	The collateral source rule does not allow jury members to take into account any payments to a plaintiff other than those made by the defendant, which means that a plaintiff can recover full damages from a defendant even after the plaintiff has been compensated from other sources, including the plaintiff's insurance or workers compensation.	Birth trauma injury to neonate; obstetric trauma to mother (vaginal delivery with instrument); obstetric trauma to mother (vaginal delivery without instrument); obstetric trauma to mother (caesarean delivery)
Alternative Payment System and Liabilities				
Chen, 2010 ⁵³	USA	"Enterprise Liability" or "Enterprise Insurance," with a	Enterprise liability and enterprise insurance both propose to remove the locus of the responsibility for medical injuries from individual physicians to the larger institutional structure in which	general obstetrics, caesarean sections

		Limited No-Fault Component	most modern medicine is practiced today. Where they differ is the attribution of liability. As their respective names indicate, enterprise liability would have hospitals, or other health care networks, be legally responsible for medical malpractice committed by physicians in their organizations. On the other hand, enterprise insurance leaves legal liability at the physician level, but requires hospitals or networks to provide insurance for negligent medical injuries to physicians under their umbrella. Enterprise liability, which would have hospitals (or other groups, such as networks, Health Maintenance Organizations, or Preferred Provider Organizations) liable for the negligence of its affiliated medical personnel even in the absence of its own fault, rests on the doctrine of respondent superior. At heart this is a strict liability doctrine	
Domin, 2004 ¹⁵	California, USA	Periodic Payments of Damages	Allows judges to order periodic payments of damages at the request of either party, but only if the award is equal to or greater than \$ 50,000	obstetrics
Domin, 2004 ¹⁵	Illinois, USA	Periodic Payments of Damages	The Illinois statute only allows periodic payments when future damages exceed \$ 250,000, and requires a defendant to show: 1) that he or she can provide security for the amount of the total claim (past and future damages), or that he or she can provide \$ 500,000, whichever is less; and 2) that future damages are likely to accrue for a period longer than one year.	obstetrics
Gilmour, 2006 ³³	Canada	periodic payment of damages	damages to be paid by way of periodic payments without the consent of both parties	general
Domin, 2004 ¹⁵	USA	experience-rated insurance	This insurance system, referred to as "experience rating," makes premiums directly dependent on the number of claims that have been brought against the insured. When applied to malpractice insurance, premiums increase according to the number of times a doctor is sued	any medical malpractice
Gilmour, 2006 ³³	USA	enterprise liability	Enterprise liability can co-exist with tort and no-fault systems. It changes the locus of liability for patient injuries from individual physicians to hospitals or other health care institutions, without requiring major changes to other rules for proving liability and damages.	general
Higgins, 2004 ²²	Oklahoma, USA	Joint and Several Liability	Joint and several liability requires each liable party to be individually responsible for the entire obligation, regardless of his respective percentage of fault. Joint and several liability allows a plaintiff to seek damages from all, some, or only one of the parties alleged to have caused the injury. In many cases, a defendant can seek indemnification or reimbursement from unnamed parties. Joint and several liability allows plaintiffs the luxury of only needing to establish that one defendant is responsible for the injury, thereby obtaining a judgment against all defendants.	any medical malpractice
Iizuka, 2013 ²⁶	USA	joint and several liability (JSL) reform	Joint and several liability allows the plaintiff to recover the full balance of his award, whether it comes from one or more	Birth trauma injury to neonate; obstetric

			defendants, without regard to the apportionment of fault among the defendants.	trauma to mother (vaginal delivery with instrument); obstetric trauma to mother (vaginal delivery without instrument); obstetric trauma to mother (caesarean delivery)
Limitations on litigation				
CMPA, 2005 ⁶	Canada	Government indemnification with tort-based filter	Government run indemnification program that applies a tort-based filter to limit the number of claims entering the system. This scenario, which follows the principles of the NHLSA system from the UK, presents a public indemnification scheme with a tort-based filter that limits the number of cases entering the system.	general
Domin, 2004 ¹⁵	California, USA	Statute of Limitations	California enacted the Medical Injury Compensation Reform Act (MICRA): The statute of limitations provision, codified in section 340.5 of the California Civil Procedure Code, requires the initiation of all medical malpractice actions within three years from the date of the injury, regardless of when the injury was discovered. The statute allows the time limit to be tolled only in cases of fraud, intentional concealment, or the presence of nontherapeutic and non-diagnostic foreign bodies. Minors are held to the same time period unless they are under six years old at the time of injury, in which case the tort action must be commenced within three years or before the minor turns eight years old, whichever is longer.	any medical malpractice
Domin, 2004 ¹⁵	Louisiana, USA	Statute of Limitations	Louisiana's statute requires the filing of all malpractice claims within one year from the date of the actual injury or discovery of the injury.	any medical malpractice
Domin, 2004 ¹⁵	New York, USA	Statute of Limitations	New York's statute proscribing special statute of limitation periods for medical malpractice cases requires that all medical malpractice actions commence within two years and six months of the date of the alleged act, omission, or failure. However, the statute provides a limited, delayed discovery exception where the malpractice involves a foreign object in the patient's body. In such a case, the action must commence within a year of when the object was discovered or when facts that would reasonably lead to such a discovery were ascertained.	any medical malpractice
van Boom, 2007 ³¹	France	reform of French health law	That in case of liability arising from a faute caractérisée committed by the medical professional or the institution – i.e., the negligent omission that rendered discovery of the handicap impossible – the parents can claim compensation for the loss they themselves suffer. This loss may include immaterial loss (for the fact that the parents' autonomy and their right to choose abortion has been violated). Children with birth defects and their families can only claim compensation from the State on the basis of specific social	perinatal injury, error, negligence

			security arrangements. Contrastingly, victims of hospital acquired infections and of l'aléa thérapeutique can either claim full compensation from the State or the physician, hospital and their liability insurer, depending on the extent of the percentage of disability (i.e., under or over 24%). So, in effect, the cause and moment of injury can be decisive: a child who is born with a genetic defect as a result of negligent misdiagnosis may be treated differently than a healthy newborn who is seriously disabled after birth by a hospital acquired infection.	
Multi-component Model				
Bogue, 2013 ¹³	Massachusetts, USA	Massachusetts Health Care Cost Containment Bill of 2012	<p>The Cost Bill implements multiple medical malpractice reforms, using both traditional modifications and non-traditional theories to improve overall health care cost control, system transparency, and quality improvement.</p> <p>- Cooling-off period: Cost Bill mandates a 182-day cooling off period, requiring plaintiffs to send written notice of intent to file a malpractice claim to the potential defendant physician before filing a lawsuit. The notice must contain the factual basis for the claim, applicable standard of care, alleged breach of that standard, alleged action that should have been taken, explanation of causation, and the names of all providers that to be included as defendants. This period may be shortened to 90 days if the claimant previously filed the same claim against another physician and provided the requisite notice. The plaintiff must then permit the named provider to access all available medical records related to the claim within 56 days of sending notice. Within 150 days of receipt of the notice, the defendant must provide a written response, including a factual basis for any available defense, comments on the standard of care, and whether the defendant met the standard of care and was a proximate cause of the alleged injury. If no response is received, then <i>the plaintiff may move forward with filing the claim after 150 days.</i></p> <p>- Damage award caps: Cost Bill increases the damage awards cap for charitable institutions, such as non-profit hospitals. Specifically, with regard to medical malpractice claims, the cap on damages was increased from \$ 20,000 to \$100,000. While this is not a large monetary increase, it may encourage more patients to include hospitals as co-defendants in suits. By increasing this cap, patients hope to recover more money to help pay for future care, medical bills, and other losses caused by a hospital's negligence. The increased hospital liability also may incentivize facilities to re-focus on patient safety, appropriate staffing, and quality equipment.</p> <p>- Disclosure and apology statute: Massachusetts bill encourages physicians to apologize to injured patients by making the apology inadmissible "as evidence in any judicial or administrative proceeding." The disclosure provision requires the provider to "fully</p>	any medical malpractice

			inform" the patient or family about any adverse medical outcome or error. The provider organization or hospital can then work with its insurer to determine fair monetary compensation where appropriate; however, it is important to note that the program should not be considered no-fault insurance because physician fault is required in order to offer compensation Full details on official programs have yet to be released, but this legislative step puts Massachusetts at the forefront of quality and cost-focused malpractice reform.	
Chow, 2007 ⁵²	USA	The Fair and Reliable Medical Justice Act of 2005 (i.e., health court model, caps on non-economic damages)	The most developed and well-known plan for health courts is Common Good's model, which replaces juries with a tribunal of judges with medical expertise gained through education or experience to establish a uniform standard of care. The proposal circumvents the "dueling experts" phenomenon by soliciting testimony from a neutral expert selected by the health court judges. It also attempts to cut the cost of trial by imposing a 20% cap on attorney contingency fees. The model includes a predetermined injury-specific rate schedule to normalize the distribution of noneconomic damages for any given injury from verdict to verdict.	high-risk specialties like obstetrics-gynecology, surgery, anesthesiology, emergency medicine, and radiology
Conroy, 2006 ¹⁴	USA	The Health Act 2005	The reform initiatives of the proposed federal HEALTH Act of 2005 aim to achieve the following objectives: (a) improve access to care; (b) reduce physicians' practice of "defensive medicine"; (c) reduce medical malpractice premiums for physicians; (d) ensure equitable compensation for injury, and; (e) enhance information sharing to reduce malpractice. To accomplish these objectives, the Act will implement the following policies: (1) Set the statute of limitations at "3 years after the date of manifestation of the injury or 1 year after the claimant discovers, or through the use of reasonable diligence should have discovered, the injury, whichever occurs first"; (2) Cap damages for noneconomic loss at \$ 250,000; (3) Limit lawyers' contingency fees; (4) Abolish joint and several liability, adopting a proportionate liability standard instead; (5) Abolish the collateral source rule; (6) Eliminate the recovery of punitive damages except for certain intentional torts, and specify the exclusive factors to be considered in determining an appropriate amount of punitive damages not to exceed \$ 250,000 or "two times the amount of economic damages awarded, whichever is greater."	any medical malpractice including obstetrical
Gilmour, 2006 ³³	USA	limiting the size and risk of judgment	(1) reducing claims, via shortened limitation periods, controls on legal fees, and other means; (2) limiting compensation paid to plaintiffs, most powerfully by (i) caps on damages awards applicable to either the non-pecuniary portion of compensation or the total recovery (ii) collateral offset provisions that require or allow reduction of damages awards by the amount of other compensation; (iii) allowing or requiring courts to order damages payable by periodic payments rather than a lump sum; (iv) ending joint and several liability; (3) altering the plaintiff's burden of proof,	general

			such as heightened requirements for expert witnesses; and (4) altering the role of the courts, for instance by mandating pre-trial screening devices or mediation.	
Hull, 2005 ²⁵	California, USA	Medical Injury Compensation Reform Act (MICRA)	A \$ 250,000 limit on noneconomic damages; A limit on attorney contingency fees based on a sliding scale; A modified collateral source rule to permit jurors to know when a claimant had health insurance; Periodic payments of future damages so that benefits accrue before being paid; A change to the statute of limitations, and; Other procedural changes to reduce frivolous suits.	obstetrics & emergency care
Hull, 2005 ²⁵	Texas, USA	Texas Alliance for Patient Access (TAPA)	A \$ 250,000 cap on noneconomic damages; No double dipping by claimants with health insurance by modifying the collateral source rule; Future benefits must be received before compensation is paid; A limit on plaintiff attorney contingency fees; A restoration of the Keeton Report statute of limitations for minors; A limit on liability for providers rendering Charity Care; Citizens with concerns about large verdicts are permitted to sit on juries; Procedural reforms designed to reduce frivolous suits; and A higher burden of proof in cases involving emergency care	obstetrics & emergency care
Liang, 2004 ²⁹	California, USA	MICRA	Some of MICRA's most significant features include a \$ 250,000 non-economic damage cap, a shortened statute of limitations, a notice of intent to sue requirement, abrogation of the collateral source rule, specific distribution of attorney's fees, allowance of periodic payments, and authorization of alternative dispute resolution.	any medical malpractice
Liang, 2004 ²⁹	Colorado, USA	Health Care Availability Act	Colorado enacted its reform legislation, the "Health Care Availability Act" ("HCAA"), in 1988. HCAA caps non-economic damages, provides for a separate limit on economic damages, limits the collateral source rule, and allows periodic damage payments.	any medical malpractice
McAfee, 2005 ³⁰	USA	Bush's proposed tort reform	(1) capping noneconomic damages at \$ 250,000, but not limiting economic damages; (2) limiting punitive damages to whichever is less: \$ 250,000 or twice the economic damages; (3) including a statute of limitations on medical malpractice cases; (4) allowing physicians to pay patient awards in installments rather than one lump sum; and (5) requiring physicians to pay the percentage of damages only for which they are directly responsible. President Bush's plan would require juries to be told whether a plaintiff has other sources for compensation for their injury.	any medical malpractice

Appendix 4. Evaluation of Strategies

First Author, Year	Setting	Short name of the strategy	Evaluation Measures	Data collection methods	Clinical results
No Fault Approach					
Bovbjerg, 2005 ³⁷	USA	Administrative compensation model	closed malpractice claims and survey	administrative data	Administrative data of closed malpractice claims and survey revealed that the programs, as intended, kept obstetric liability coverage available and decreased tort premiums. Administrative claims were much lower than expected (196 during the first 8 years in Florida, 30 in 9 years in Virginia), not unaffordably numerous as some opponents of reform had claimed.
Edwards, 2010 ¹⁶	Virginia, USA	No-fault insurance	physician-specific adjusted caesarean rate, physician participation in BIP	Virginia Health Information (V.H.I.), a non-profit public/private partnership, The dataset uses 2006 obstetrical delivery statistics that hospitals are legally required to report to V.H.I.	Virginia's tort reform shields participating physicians almost entirely from the negative effects of malpractice claims for certain injuries; results do not support the theory of reduced defensive medicine and provide at most mild evidence suggesting that the Birth Injury Program induces physicians to practice less defensively
Safety Program and Practice Guidelines					
Milne, 2013 ⁴²	Canada	Managing Obstetrical Risk Efficiently (MORE)	clinical core content knowledge; behavioural change and liability claims	survey	Patient safety showed the highest average increase over an incremental time period, with a 20% increase; Liability claims: a significant reduction (P < 0.001) was shown in average incurred costs in the obstetrics labour and delivery units after the onset of the program
Pegalis, 2012 ⁴⁵	USA	Patient safety guidelines	safety	closed claims	incidence of anesthesia-related deaths dropped from one to two per 10,000 anesthetic procedures to one for every 200,000 procedures
Pettker, 2014 ⁴⁶	USA	Obstetric safety program	number of liability cases per 1000 deliveries/per year, claims, payments	liability claims collected and classified	although we did not specifically encourage any defensive practices during the study period, we did note that our caesarean delivery rate increased over time, in step with national trends
Santos, 2015 ⁴⁷	USA	Risk reduction labor and delivery model	rate of event reporting and high-risk malpractice event rate per 1000 births	Medical liability risk and administrative data sets were analyzed, interviews	50% reduction in shoulder dystocia and fetal distress cases
Winn, 2007 ⁵⁰	UK	Clinical Negligence	contribution calculation for maternity includes the number of	hospital admin records, claims data	There are no definitive data to demonstrate that the CNST Maternity

		Scheme for Trusts	births, and a trust will earn discounts as a part of the contribution assessment of maternity services, number and cost of claims		Standards have made a difference to patients when measured by outcomes such as claims
Communication and Resolution					
Ho, 2011 ²³	USA	Apology law	claim severity	data are drawn from the NPDB database	The effect of apology laws on the size of payment: apologies are most valuable for cases involving obstetrics and anesthesia, for cases involving infants, and for cases involving improper management by the physician and failures to diagnose.
Caps of Compensation and Attorney Fees					
Behrens, 2011 ³⁴	Mississippi, USA	Mississippi tort reform legislation	Data regarding lawsuits against physicians insured by the Medical Assurance Company of Mississippi (MACM)	data from the Medical Assurance Company of Mississippi were used	It is noteworthy that the number of MACM-insured Physicians increased in Mississippi after the implementation of tort reform.; Although tort reforms (particularly the limit on noneconomic damages and pursuit notice) reportedly have enabled MACM to resolve some claims more easily, these reforms have also significantly reduced the frequency of both claims and lawsuits.
Iizuka, 2013 ²⁶	USA	Caps on non-economic damages (CapsNED)	4 Patient safety indicators; "I estimated three models to examine the relationship between tort reforms and preventable medical complications."	The data used in my analysis are drawn from two sources: Nationwide Inpatient Sample (NIS), information on state tort reform (the second data set)	The results for CapsNED and CSR reform are mixed and not necessarily consistent with the predicted impact. For example, in only one case were CapsNED associated with a higher probability of medical errors. However, these comparisons are only suggestive because many factors, including state fixed-effects, are not yet controlled
Iizuka, 2013 ²⁶	USA	Caps on punitive damages (CapsPD)	4 Patient safety indicators; "I estimated three models to examine the relationship between tort reforms and preventable medical complications."	The data used in my analysis are drawn from two sources: Nationwide Inpatient Sample (NIS), information on state tort reform (the second data set)	States with CapsPD have more medical errors than the states without these caps
Iizuka, 2013 ²⁶	USA	Collateral source rule (CSR) reform	4 Patient safety indicators; "I estimated three models to examine the relationship between tort reforms and preventable medical complications."	The data used in my analysis are drawn from two sources: Nationwide Inpatient Sample (NIS), information on state tort reform (the second data set)	The results for CapsNED and CSR reform are mixed and not necessarily consistent with the predicted impact. For example, in only one case were CapsNED associated with a higher probability of medical errors. However, these comparisons are only

					suggestive
Alternative Payment System and Liabilities					
Iizuka, 2013 ²⁶	USA	Joint and several liability (JSL) reform	4 Patient safety indicators; "I estimated three models to examine the relationship between tort reforms and preventable medical complications."	The data used in my analysis are drawn from two sources: Nationwide Inpatient Sample (NIS), information on state tort reform (the second data set)	States with JSL reform have fewer medical errors than states without the reform

Appendix 5. Strategy Outcomes

First Author, Year	Setting	Short name of the strategy	Advantages	Cost savings	Limitations
No Fault Approach					
Berkowitz, 2009 ³⁵	New York, USA	no-fault compensation scheme	financial status of the family has no bearing on the amount of money they will receive; author argues it is fair, rational, and affordable	NR	The financing of this program is of considerable concern, but it is believed that elimination of the exorbitant administrative costs of the current tort system will go a long way toward paying for it.
Bovbjerg, 2005 ³⁷	USA	administrative compensation model	decreased tort premiums; administrative claims were much lower; claims resolution was fast and once claims were filed (a median time to resolution of 148 days from filing, compared with 591 days in tort), but the time from injury to filing was the same in both systems.	Administrative costs (overhead) were low (10.3% vs. 46.9%)	NR
Chen, 2010 ⁵³	USA	no-fault liability	able to compensate victims of medical errors while avoiding the high cost of litigation; would encourage medical professionals to admit errors and compensate victims quickly, and at the same time generate incentives to avoid medical maloccurrences; promote peer review, professional self-regulation, and an attention to clinical outcomes	A quicker and a wider base of compensation, reduced litigation costs, and an idealized outcome for deterrence based on rapid discoveries of errors and peer review are the principal justifications for no-fault medical liability.	wider distribution of compensation may outweigh cost-savings from lowered court costs; removing negligence as a basis for compensation may exacerbate the under-deterrence problem of tort liability; medical no-fault would almost certainly be more expensive than tort-based malpractice liability
CMPA, 2005 ⁶	Canada	no-fault compensation system	This system would provide universal access to per case indemnities of, on average, approximately \$235,000.	NR	at 150 times the cost of the current program, it is unclear how the medical community could finance this program or how the healthcare system could support an almost \$40 billion dollar increase in healthcare costs; it is neither focused on improving the safety nor on improving the performance of the healthcare system
CMPA, 2005 ⁶	Canada	combination tort and no-fault system	would reduce the filter and would therefore allow more claims into the system	NR	increase the number of claims flowing into the system (the total cost of medical liability could rise from today's current level of \$225 million to \$2.8 billion per year); it is not clear how an additional

					\$1.5 to \$2.5 billion dollars per year in health care costs focused solely on injury indemnification would be viewed and paid for by the healthcare system's stakeholders
CMPA, 2005 ⁶	Canada	severely compromised infant program	A NICA-type program has the potential to reduce the "lottery effect" of a tort-based system for severely compromised infants	NR	Indemnifying all severely compromised infants at current day levels, would add \$383 million per year to the total cost of medical treatment injury indemnification, due to the increase in the number of cases that would be indemnified. In the second alternative, by allowing all severely compromised infant cases to enter the system and compensating at a "fair and reasonable" level, the total cost of medical treatment injury indemnification would be expected to increase by \$221 million to \$446 million per year.
Domin, 2004 ¹⁵	Virginia, USA	No-fault compensation	Patients, hospitals, and physicians most likely will find a no-fault system appealing where avoidable adverse events are identified and patients are compensated appropriately. Proponents of no-fault, for instance, suggest that this system gives physicians the freedom to practice in an environment without worrying about the economic and psychological effects of litigation. By removing certain narrowly defined types of birth-related neurological injuries from the tort system, this legislation aims to reduce the number of damage awards that result from malpractice claims against obstetricians. Both NICA and Virginia's Act have withstood constitutional challenges thus far.	reduced legal costs, less delay in monetary recovery, shorter time involvement on the part of the doctors, and decreased incidence of defensive medicine due to the strict liability nature of no-fault	Some opponents of no-fault liability systems argue that such systems are inherently flawed. This argument is based on the assumption that courts will hold some doctors liable for failure to prevent a bad outcome, even after they did everything in their power to treat a patient. Conversely, for those cases that involve avoidable instances of negligence, a no-fault system by its very name removes any degree of personal physician responsibility. Nevertheless, these cases also issue a warning of the possible constitutional challenges that similar statutes might face if enacted in other states or by the federal government. Other jurisdictions may not decide in favor of notice and fee provisions akin to those in NICA and Virginia's Act.
Domin, 2004 ¹⁵	Florida, USA	No-fault compensation	Patients, hospitals, and physicians most likely will find a no-fault system appealing where avoidable adverse events are identified and patients are compensated appropriately. Proponents of no-	NR	Some opponents of no-fault liability systems argue that such systems are inherently flawed. This argument is based on the assumption that courts will hold some doctors liable for failure to prevent a bad outcome, even after they did

			<p>fault, for instance, suggest that this system gives physicians the freedom to practice in an environment without worrying about the economic and psychological effects of litigation. Both NICA and Virginia's Act have withstood constitutional challenges.</p>		<p>everything in their power to treat a patient. Conversely, for those cases that involve avoidable instances of negligence, a no-fault system by its very name removes any degree of personal physician responsibility. Nevertheless, these cases also issue a warning of the possible constitutional challenges that similar statutes might face if enacted in other states or by the federal government. Other jurisdictions may not decide in favor of notice and fee provisions akin to those in NICA and Virginia's Act.</p>
Edwards, 2010 ¹⁶	Virginia, USA	no-fault insurance	<p>BIP participating physicians are shielded against malpractice liability for covered injuries as patients eligible for BIP are prohibited from filing any lawsuits related to their injuries; BIP coverage also provides physicians with substantial time savings (i.e., program informs physicians of claims filed against them; however, they play no role in the proceedings other than turning over medical records and are not informed of the results)</p>	<p>Obstetricians in Virginia enjoyed relatively low malpractice premiums when compared to national rates</p>	<p>limited scope: covering only birth-related neurological injuries that result from oxygen deprivation; BIP participants are still exposed to significant malpractice risk from the vast majority of injuries that can result from a delivery, hence practice of defensive medicine will not be completely mediated</p>
Gilmour, 2006 ³³	USA	no-fault administrative compensation	<p>Provide a fairer way to compensate injured patients; avoid the damaging effects of adversarial civil litigation, and; reduce malpractice insurance premiums.</p>	<p>Both states narrowly limit eligibility for compensation, and while both provide broad benefits, they are more limited than those potentially available in a successful tort claim</p>	<p>"Leakage" of cases to the tort system, adequacy of future funding, as well as provider and hospital reluctance to tell parents about the programs have been identified as concerns</p>
Gilmour, 2006 ³³	USA	The Institute of Medicine: Demonstration Projects	<p>These systems would incorporate incentives for health care providers to report and analyze medical mistakes, and involve patients in efforts to reduce errors</p>	NR	NR
Gilmour, 2006 ³³	USA	no-fault administrative systems	<p>supporters argue that on the whole, experience has been sufficiently positive to warrant closer considerations</p>	NR	<p>critics argue that either the cost of such a system would be prohibitive, or the level of compensation provided, particularly to those most seriously injured, would be</p>

					seriously inadequate
Gilmour, 2006 ³³	New Zealand	accident compensation system (<i>no-tort compensation</i>)	the new approach is meant to improve patient safety, because health care providers were expected to be less defensive about helping to identify what went wrong when they no longer faced the prospect of fault-finding as a necessary part of that process; claims can be made more easily, and are less costly, more certain, and more quickly resolved than the tort system	under the accident compensation system, claims can be made more easily, and are less costly, more certain, and more quickly resolved than a lawsuit alleging clinical negligence	Disclosure remains an issue; privilege for quality assurance (QA) activities is also an issue. On application to the Minister of Health, quality assurance activities can be declared protected if it is in the public interest to do so; the HDC has a policy of not identifying practitioners involved in the complaints process, other than disciplinary cases, which may allow incompetent practitioners to continue their practice and harming patients
Gregg, 2005 ¹⁹	USA	No-fault insurance	in theory, no-fault theories address problems in care by doctors, problems in compensation to injured patients, and problems in rising premiums for doctors	NR	in practice, there is no support for a no-fault system: not from the medical profession, not from the plaintiffs' bar, and not from the insurance industry
Gurewitsch, 2007 ³⁹	USA	no-fault compensation programs	no-fault programs are successful in reducing litigation while effectively compensating affected individuals	NR	there are important pathophysiologic (i.e., injury mechanistic) differences between cerebral palsy and brachial plexus injury to consider that from a standpoint of applicability make a <i>no-fault approach</i> more difficult to use for the latter type of birth injury than for the former
Huang, 2009 ²⁴	USA	No-fault system	NR	American systems successfully reduced the costs of insurance for obstetricians and vaccine suppliers	excludes too many injured patients; it is not clear that the actual quality of medical care and patient safety really improves, either in theory or in practice
Leflar, 2011 ²⁷	Japan	No-fault compensation	popular with providers of childbirth services: 99.7% of childbirth facilities in the nation have signed up to participate; it has been a financial boon to the insurance companies responsible for paying compensation to families of injured infants (far more has been collected in premiums than is owed to families for the infants certified to date)	NR	the effects on the quality of obstetrical care and on malpractice claims and litigation is unclear
Leflar, 2012 ²⁸	Japan	No-fault compensation	essentially all childbirth facilities in the nation (99.7 percent) have signed up to participate; the system had reviewed 152 applications for compensation and	it is running a considerable surplus at present, greatly benefitting participating private insurers (and imposing a substantial	the new system's effect on the quality of obstetrical care and on malpractice claiming practices remain to be researched

			accepted 139, which exceeds the proportion of cerebral palsy cases compensated by the Florida system	cost onto the social insurance system)	
Milland, 2014 ⁵¹	Denmark	centralized compensation system	an impartial experienced medical specialist in that particular field will most likely have a better basis for adjudicating concerns of medical negligence	NR	NR
Miller, 2011 ⁴¹	Florida & Virginia, USA	no-fault compensation scheme	experts agree that both the Virginia and Florida programs been successful at decreasing the number of malpractice claims and lowering malpractice premiums	lowered malpractice premiums	limited to infants born in a hospital and born alive; lack the potential for improved care through feedback from neutral experts; although transparency, disclosure, and early offer approaches may decrease claims and provide greater satisfaction for patients and clinicians, they may not be designed to promote widespread practice changes
Strunk, 2010 ⁴⁸	USA	birth injury compensation funds	will facilitate disclosure and apology to patients, as well as encourage collaboration in identifying root cause and systems analysis	NR	NR
Strunk, 2010 ⁴⁸	Denmark and Sweden	administrative compensation	will facilitate disclosure and apology to patients, as well as have collaboration in root cause and systems analysis; time for handling claims is shorter and administrative costs are low; better patient-physician relationship; physicians can concentrate on patient care and not focus on litigation	NR	NR
van Boom, 2007 ³¹	New Zealand	no fault compensation scheme	NR	NR	NR
van Boom, 2007 ³¹	Virginia, USA	no-fault compensation scheme	since enactment, insurability of liability risks improved considerably	NR	more cases get compensated than under the negligence system; although the category of genetic defects is outside the Program, it is believed that the total amount that is contributed by physicians and hospitals to the Program annually in fact exceeds the total cost of the medical negligence system
van Boom, 2007 ³¹	Florida, USA	no-fault compensation	NR	NICA has not stopped liability insurance	NICA criticised for its modest scope; among the reasons for choosing not to

		scheme		premiums for obstetricians and gynaecologists from soaring	shift from liability to an alternative scheme three stand out: interest group counter-weight pressure (e.g., personal injury lawyers advocating the adversarial system), fear of lack of control for effective cost containment and fear of leakage into the scheme of non-avoidable harm.
van Boom, 2007 ³¹	Germany	specific trust fund	NR	NR	NR
van Boom, 2007 ³¹	UK	redress scheme	NR	NR	NR
Safety Program and Practice Guidelines					
Avraham, 2011 ¹²	USA	Private Regulation Regime (PRR)	the PRR would be better able to determine floors and ceilings for guideline procedures than current medical practice or guideline promulgators; safe and efficient guidelines incentivized through liability; ex ante liability will incentivize firms not to promulgate overly defensive guidelines; for doctors, the shelter from malpractice liability would enable them to focus more time on healing their patients and less time preparing for their day in court	the PRR attacks all three cost-drivers at once: medical errors, offensive medicine, and defensive medicine	initial administrative complexities
Milne, 2013 ⁴²	Canada	Managing Obstetrical Risk Efficiently (MORE)	A robust, flexible goal-setting process for use in all hospital settings in all geographic environments, as well as a strong evaluation process to measure the program's impact and be able to demonstrate the return on investment for each client hospital.	a significant reduction(P<0.001) was shown in average incurred costs in the obstetrics labour and delivery units after the onset of the program	the findings of the study were possibly limited to a slight degree in that not all facilities had completed the third learning module at the time of data collection; time commitment, funding
Nazeer, 2012 ⁴³	UK	"never events" list and guidelines	'never events' list contains events that are unacceptable and eminently preventable in the NHS; aims to increase awareness of serious incidents and encourage more vigilance across the Trusts; highlights 'near misses', which otherwise would go unnoticed; the incidence report will reflect the organization's level of adherence to implementation of the correct	NR	critics feel there is a lack of leadership with regards to how this policy will be run in the NHS; no clear indication of how events will be investigated and the ensuing learning process is somewhat vague

			processes to prevent harmful incidents		
Pearlman, 2006 ⁴⁴	USA	Recommendations for Improved Patient Safety	NR	NR	NR
Pegalis, 2012 ⁴⁵	USA	Patient safety guidelines	improves safety, lessens litigation, decreased deaths, reduction in medical malpractice insurance premiums, happier profession	drive down the costs and incidence of medical malpractice litigation; improved professional satisfaction for member physicians	validation of safety guidelines based on closed-claims data is lacking
Pettker, 2014 ⁴⁶	USA	Obstetric safety program	Dramatic reduction in liability claims and liability payments.	closed-case analysis revealed that payments were drastically reduced after the patient safety effort, from \$50.7 million to \$2.2 million; the median monetary amount per case resulting in payment to the claimant was \$632,262 vs. \$216,815 (p < .046)	NR
Santos, 2015 ⁴⁷	USA	risk reduction labor and delivery model	reporting of unintended events increased significantly, high-risk malpractice events decreased significantly	decrease in malpractice claims	NR
Winn, 2007 ⁵⁰	UK	Clinical Negligence Scheme for Trusts	to improve communication, ensure that staff are trained and competent in their duties; to treat and where possible avoid known risks that result in adverse patient incidents and claims, and; to proactively identify new or potential risks that may be avoided; increase in levels of incident/near miss reporting; increased standards compliance and better patient safety; improved system for information and communication,	decrease in the number and cost of maternity claims as a percentage of total clinical negligence claims	no definitive data to demonstrate that the CNST Maternity Standards have made a difference to patients
Specialized Courts and Alternative Claim Resolution					
Capstick, 2004 ³⁸	UK	NHS redress scheme	NR	reduces the defense costs incurred in processing compensation payments	increased litigation claims; will not reduce the excessive legal costs of processing inflated claims that are eventually settled for small amounts; the proposed scheme

					removes any deterrent to borderline or frivolous claims; boost the compensation culture
Furrow, 2011 ¹⁷	USA	special courts for small medical injuries	swift compensation for smaller injuries that otherwise never receive compensation under the current system	NR	NR
Gilmour, 2006 ³³	UK	NHS redress bill	NR	expected to increase spending on compensation in the short term, but savings will be realized in the longer term due to reduction in expenditures on legal costs	However, a number of patient and consumer groups have strongly criticized it because (1) the NHS itself would decide the merits of any case for redress, (2) patients would not have access to specialist medico-legal advice essential to influence decisions about their claims, and (3) robust mechanisms to ensure patient safety lessons are learnt are lacking
Gregg, 2005 ¹⁹	USA	screening panels	the panels have shown some success in reducing frivolous claims	NR	in some jurisdiction, panel's decision does not bind the plaintiff - the plaintiffs can merely use the screening panel as a testing ground for their lawsuit and beef up their case for trial if the first go-round proves unsuccessful
Gurewitsch, 2007 ³⁹	USA	peer review of expert testimony	hoped-for effect is that fewer experts would be willing to make dogmatic statements that fuel the absolutist arguments, this in turn would curb the level of compensation in those cases won by plaintiffs and with it the incentive to pursue litigation in the first place	NR	NR
Hannah, 2009 ²⁰	USA	health court	designed to rapidly resolve claims thereby reducing the emotional toil and high financial costs associated with traditional litigation; one of the most important advantages of a health court system would be its move away from blaming individual physicians -- without the fear of liability and the stigma attached to being found "negligent," physicians would be more likely to share information about adverse events and improve patient safety	cost-efficient	a state statute mandate would likely face challenges under state constitutional provisions dealing with due process, equal protection, separation of powers, right to jury trial, and access to courts; voluntary participation would face legal challenges based on pre-dispute contractual agreements involving personal injury claims, waivers of constitutional rights and the law of unconscionability

Hedrick, 2007 ²¹	Oregon, USA	Medical review & screening panel	attempt to "weed out" non-meritorious cases and encourage prompt settlement before parties incur the costs of a trial	the evidence suggests that this reform type significantly affects medical liability premiums, though the extent to which it does so varies by physician specialty; establishing pretrial screening panels reduces obstetrics/gynecology premiums by about 7% the year after they are introduced; in the long run, this effect is 20%.	NR
Holbrook, 2008 ⁴⁰	USA	arbitration	arbitration of disputes can be cheaper, faster, less stressful, and more predictable than litigation; arbitrators often have expertise in the subject matter of the dispute and are less likely to be swayed by sympathy or prejudice than are jurors	NR	consumer rights organizations have criticized mandatory binding arbitration; arbitrators may serve on repeat arbitrations involving one business or industry; arbitration is not cheap and a consumer may not be able to pay arbitration fees; although consumers may win more often, they get smaller awards of money; it is very difficult to get an unfair arbitration award overturned by a court
Leflar, 2011 ²⁷	Japan	health care specialty courts	"conference of experts" system is helpful in promoting settlements, particularly when the court-appointed experts are unanimous in their opinions because both parties see clearly where they stand; since the institution of the divisions, the duration of medical trials have decreased	NR	it is difficult to ascertain whether the quality of adjudication has improved as a result of these various reforms, although commentary by judges with experience in the health care divisions has generally been favorable
Miller, 2011 ⁴¹	USA, Denmark, Sweden	administrative health courts	encourages disclosure and transparency related to unintended outcomes, which is fundamental to justice for patients, clinicians and society	NR	NR
Communication and Resolution					
Bovbjerg, 2005 ³⁷	USA	disclosure plus patient safety	some support it as a practical risk-management strategy, and disclosure in other spheres has had some positive impacts	early experience within VA health system suggests that disclosure with compensation is cost-effective	providers fear that disclosure will simply facilitate lawsuits
Furrow,	USA	mediation	mediation, like arbitration,	lower costs	NR

2011 ¹⁷			promises diminished complexity in fact finding, lower costs, fairer results, greater access for plaintiffs with smaller claims, and a reduced burden on the courts; mediation provides a useful model so long as it is optional -- the plaintiff can elect to litigate if dissatisfied with the results		
Furrow, 2011 ¹⁷	USA	offer	NR	NR	NR
Furrow, 2011 ¹⁷	USA	apology law	admissions of liability from apology laws are also a potentially valuable source of aggregate information about medical error; findings suggest that apology laws reduce the amount of time it takes to reach a settlement in what would normally be protracted lawsuits, leading to more resolved cases in the short terms and fewer case overall in the long run	plaintiffs will settle for lower amounts if they also receive an apology	such proposals offer a strategic tool to buy off plaintiffs by showing them how sorry the provider is, and to rush settlement by getting plaintiff lawyers to buy into early settlement; the provider controls the screening for potential claims as a filtering mechanism to reduce payouts, which is the wrong direction for tort reform
Furrow, 2011 ¹⁷	USA	enterprise strict liability	NR	NR	NR
Geckeler, 2007 ¹⁸	USA	MEDIC Act	1) medical professionals would be given new incentives to disclose errors that would have previously remained unreported; (2) hospital administrators would be able to comprehensively compare their data on medical errors against other participants' data, and would be able to identify and target internal systems that generate comparatively high occurrences of medical errors; (3) the Office of Patient Safety and Health Care Quality would be able to identify nationwide patient safety deficiencies and recommend improvements to the United States Department of Health and Human Services; and (4) medical malpractice liability insurers would be able to more effectively analyze risk factors	reduce the cost of medical liability insurance for doctors, hospitals, and healthcare providers by reducing the actual rates of preventable medical errors	NR

Gilmour, 2006 ³³	Australia	open disclosure	open, honest, and immediate communication, acknowledging that things had gone wrong and providing reassurance to patients and their carers that lessons learned will help prevent a recurrence; improve patient safety; consistent with health care providers' ethical obligations, and; reduce the likelihood of lawsuits	reducing the likelihood of lawsuits	tensions inherent in introducing open disclosure into an existing landscape of complex legal relations, rights, obligations, regulation and liabilities will affect its chances of success
Hedrick, 2007 ²¹	Oregon, USA	apology statute	an authentic and sincere apology or expression of caring and concern over patient's outcome has tremendous influence in strengthening the physician-patient relationship and promoting trust; reduces the likelihood that the patient will seek answers through the financially and emotionally taxing legal system	NR	such statutes do nothing to prevent or discourage malpractice insurance providers from discouraging physicians from offering such a statement
Ho, 2011 ²³	USA	apology law	apologies have substantial value either as evidence for the courts, or as a mechanism that helps alleviate a patient's demands for restitution	the passage of the apology law accounts for a \$32,342 (12.8 percent) decrease in the size of malpractice payments	if doctors are short-sighted in their apologies, then more apologies by doctors could increase the awareness of mistakes by patients and thus lead to more lawsuits; if patients become aware that the consequences of an apology are reduced, then the law would effectively devalue all apologies made by doctors, and potentially worsen patient-doctor relationships on average; if apologies are successful at reducing the consequences of malpractice errors, then we may expect to see an increase in medical errors as well
Holbrook, 2008 ⁴⁰	USA	negotiation	alternative to litigation	NR	during story-telling the other likely would become more threatened, more defensive, and more self-protective, this negatively reactive cycle typically leads to a so-called death spiral of arguing, name-calling, shouting or sulking, and finally walking out in a huff
Holbrook, 2008 ⁴⁰	USA	mediation	alternative to litigation; quicker resolution	NR	NR
Strunk, 2010 ⁴⁸	USA	binding early offers of recovery	will facilitate disclosure and apology to patients, as well as encourage collaboration in	in Texas, savings grew to \$1,367,000 per case from binding early offers	NR

			identifying root cause and systems analysis		
Strunk, 2010 ⁴⁸	USA	nonbinding, voluntary administrative compensation	fosters early and complete reporting of untoward outcomes; engenders trust; provides opportunity for education and improvement of patient safety; achieves the goal of prompt and fair compensation for adverse medical outcomes or medical errors, albeit mostly in cases where injuries are not severe; allows questions about quality of care, patient safety, and physician or institutional performance to be addressed in more appropriate and constructive venues	NR	NR
Yee, 2006 ³²	USA	mediation	mediation avoids excessive litigation costs and facilitates timely resolution; maintains confidentiality; preserves the doctor-patient relationship; encourages small-scale, but useful improvements in medical practice; of cases that generally go to mediation, approximately 85% settle as a result of the mediation, additionally, when mediation is conducted early in the dispute resolution process, 80% of the cases that would otherwise be litigated are settled; and parties are responsible only for the preparation and costs equivalent to paying for a single deposition	Mediation can avoid the soaring costs associated with the litigation, such as attorneys' fees and other out-of-pocket expenses that reduce the award as much as 50%.	NR
Caps on Compensation & Attorney Fees					
Behrens, 2011 ³⁴	Mississippi, USA	Mississippi tort reform legislation	medical liability insurance premiums for MACM-insured physicians have been both reduced and refunded each year for the past 5 years (2006–2010)	doctors covered by MACM did not receive an increase in premiums in 2005; premiums were reduced, and refunds were given each year from 2006 to 2010	NR
Berkowitz, 2010 ³⁶	USA	tort reform	decrease in the number of lawsuits filed; an increase in the number of medical liability	as of 2009 all of the major physician liability carriers in the state (of Texas) had	NR

			insurance underwriters doing business in the state from 4 to more than 30; increase in the number of physicians applying for licenses to practice in Texas from 2,561 to more than 4,000	cut their premium rates, most by double digits, and 26 rural counties added at least one obstetrician, including 10 counties that previously had none	
Bovbjerg, 2005 ³⁷	USA	tort reform caps	caps on awards work as intended by physicians and other advocates; limitations substantially reduce payouts on malpractice claims and lower premiums	nonpartisan Congressional Budget Office recently concluded that caps and other California-style reforms would cut premiums nationally by 25% to 30%-more in unreformed states-although this decrease would lower health care costs by only approximately 0.4%	research also shows that caps achieve their large savings by discriminating against the most severe injuries; caps' impacts on "defensive medicine" is unclear
Domin, 2004 ¹⁵	California, USA	jury award caps	reduced risk should help curb rising insurance premiums, thereby discouraging obstetricians from giving up the practice of obstetrics; the Supreme Court of California held that the statute does not deny due process because it relates to the state's legitimate interest in reducing the cost of medical malpractice insurance and did not violate equal protection	rationality relates to the state's legitimate interest in reducing the cost of medical malpractice insurance	one result of these caps may be that some legitimate victims of negligence suffer because some lawyers refuse to represent malpractice victims when a cap is in place
Domin, 2004 ¹⁵	Virginia, USA	jury award caps	reduced risk should help curb rising insurance premiums, thereby discouraging obstetricians from giving up the practice of obstetrics; withstood constitutional challenges	NR	one result of these caps may be that some legitimate victims of negligence suffer because some lawyers refuse to represent malpractice victims when a cap is in place
Domin, 2004 ¹⁵	Illinois, USA	Elimination of Punitive Damages	withstood constitutional challenges	NR	NR
Domin, 2004 ¹⁵	New York, USA	Monetary Limitations on Plaintiff's Attorney Fees	reduce the monetary incentive for attorneys to seek excessive jury awards and to ensure that more of the award goes to the plaintiff	according to the statute, if a jury awards \$2 million in damages, the attorney would receive \$ 300,000, which is half of what the attorney would receive if the standard contingency	NR

				of 30% were applied; decreases the incentive for attorneys to take malpractice cases on a contingency basis	
Domin, 2004 ¹⁵	Arizona, USA	Monetary Limitations on Plaintiff's Attorney Fees	allows for the limitation of attorneys' fees while still maintaining a certain degree of flexibility	NR	NR
Higgins, 2004 ²²	Oklahoma & Texas, USA	Caps On Noneconomic Damages	capped award lowers the possible benefit of bringing suit; consequently, the number of lawsuits may fall	NR	encourages frivolous lawsuits
Liang, 2004 ²⁹	Wisconsin, USA	Non-economic damage cap	Wisconsin's tort reform has been effective in lowering the state's medical malpractice loss ratio; damage cap increases the profitability of insurance providers, benefiting those firms that would have suffered the greatest losses prior to reform efforts; Wisconsin's non-economic damage cap appears to eliminate liability outliers by having the greatest effect on the upper right tail of the loss ratio distribution	NR	NR
Furrow, 2011 ¹⁷	USA	Damage Award Reforms	caps may create predictability for insurers calculating their risk exposure	NR	but they clearly are cruel, denying recovery for real harms and failing to keep up with inflation in health care generally; may also be counterproductive, reducing provider liability risk and leading to unnecessary and harmful procedures
Iizuka, 2013 ²⁶	USA	caps on non-economic damages (CapsNED)	Expected to reduce the malpractice liability pressure that medical providers face, which, in turn, may increase preventable medical errors.	NR	often difficult to determine the precise value of these damages, and without a cap, juries may award a large amount of money in these cases
Iizuka, 2013 ²⁶	USA	caps on punitive damages (CapsPD)	reduces the malpractice liability pressure that medical providers face	NR	may increase preventable medical errors
Gregg, 2005 ¹⁹	USA	Limitations on Non-economic Damage Awards	non-economic caps are essential to prevent windfalls to plaintiffs and to lower insurance costs for doctors	NR	adversely affect those most severely injured, whereas people who are not severely injured often find themselves adequately compensated with or without caps -- because their recoveries are often

					less than the statutory cap; caps that legislatures choose may be even more arbitrary than the non-economic damages that juries award
Gregg, 2005 ¹⁹	USA	Sliding Scale Contingent Fee Systems	NR	NR	may prevent legitimate suits, reducing attorneys' contingency fees makes these attorneys much less likely to take malpractice cases and undercuts injured patients' available remedies
Weinstein, 2009 ⁴⁹	Wisconsin, California, Oregon, Texas [USA]	cap on noneconomic damages	caps have been proven to keep premiums down, have been shown to address the manpower needs to improve the access to healthcare, and to decrease healthcare costs, and Decreases number of lawsuits	keep premiums down, decreases healthcare costs	NR
Liang, 2004 ²⁹	Indiana, USA	Tort reform	Medical malpractice premiums dropped immediately after Indiana's tort reform and have stayed low since then; healthcare providers and insurers are highly satisfied with the system.	Indiana's reform has not affected healthcare costs, there has not been a marked difference in patterns of healthcare expenditures or the number of physicians per 100,000 people in Indiana before and after the reform	access may not actually have improved
Domin, 2004 ¹⁵	Arizona, USA	abolition of the collateral source rule	by abolishing this rule, and admitting evidence of collateral benefits received by plaintiffs, juries more accurately can assess the amount of money that is truly needed to compensate the plaintiffs for their injuries; withstood constitutional challenges, specifically, the court held that the collateral source rule did not violate Arizona's constitutional prohibition against "special laws"	to control the rising medical malpractice insurance premiums burdening Arizona doctors	NR
Domin, 2004 ¹⁵	Kansas, USA	abolition of the collateral source rule	by abolishing this rule, and admitting evidence of collateral benefits received by plaintiffs, juries more accurately can assess the amount of money that is truly needed to compensate the plaintiffs for their injuries	NR	found unconstitutional
Gregg,	USA	Abrogation of	NR	NR	ignore that plaintiffs must use these

2005 ¹⁹		the Collateral Source Rule			collateral source payments to offset the litigation costs they owe their attorneys; while it curtails some of the problems of the malfunctioning malpractice system, these benefits are not only minimal but also come at a heavy cost to the injured patient
Higgins, 2004 ²²	Oklahoma, USA	Reform to the Collateral Source Rule	proponents of the collateral source rule contend that potential defendants who may absorb the entire cost of the alleged negligent conduct will provide better care, whereas defendants facing responsibility for a smaller payment have less incentive to practice due care	NR	opponents of the rule assert that the rule promotes double compensation, which effectively lowers the plaintiff's incentive to exercise due care; opponents contend that the collateral source rule potentially promotes filing of lawsuits by inflating the size of possible judgments
Iizuka, 2013 ²⁶	USA	collateral source rule (CSR) reform	collateral source rule reform either permits or requires courts to reduce awards by the amount paid to the plaintiff by collateral sources, which is likely to reduce the liability pressure on the medical provider	NR	NR
Alternative Payment System and Liabilities					
Chen, 2010 ⁵³	USA	"Enterprise Liability" or "Enterprise Insurance," with a Limited No-Fault Component	by not imposing legal liability on the hospital, some of the sting of enterprise liability would be removed; when a hospital offers insurance to its affiliated medical staff and physicians, it could conceivably require them to bear some cost of the insurance, so that deterrence operates not only at the enterprise level, but also at the individual level	by aggregating liability at the enterprise level, greater precision in determining malpractice premiums can be achieved	hospitals find the vicarious liability imposed by enterprise liability to be an extra and unwelcome burden; physician groups fear loss of professional autonomy
Domin, 2004 ¹⁵	California, USA	Periodic Payments of Damages	ease the burden of paying one lump sum for costly jury awards, insurance companies likewise will not be required to pay an expensive jury award all at once, thereby rendering obstetricians less burdensome clients to cover	NR	NR
Domin, 2004 ¹⁵	Illinois, USA	Periodic Payments of Damages	ease the burden of paying one lump sum for costly jury awards, insurance companies likewise will	NR	NR

			not be required to pay an expensive jury award all at once, thereby rendering obstetricians less burdensome clients to cover		
Gilmour, 2006 ³³	Canada	periodic payment of damages	NR	NR	scheduled periodic payments raise concerns that plaintiffs' decisions about how to spend the damages awarded would be restricted
Domin, 2004 ¹⁵	USA	experience-rated insurance	NR	NR	experience rating only has been experimented with statutorily in a few states and has not yet been the subject of a major case
Gilmour, 2006 ³³	USA	enterprise liability	institutions are better able to undertake systemic analysis, and also have the ability to plan and institute effective system-wide responses; enterprise liability is also favoured because it would both sharpen and better focus the deterrent signals sent by a finding of liability	reduced liability	physicians are concerned about the loss of autonomy entailed in such a shift; they foresee professional control over clinical decision-making becoming subject to institutional control
Higgins, 2004 ²²	Oklahoma, USA	Joint and Several Liability	proponents maintain that joint and several liability promotes full and quick compensation for plaintiffs	NR	potentially allows plaintiffs to bring marginal to frivolous suits against wealthy defendants by eliminating the need to prove the liability of each separate defendant to obtain judgment against all defendants
Iizuka, 2013 ²⁶	USA	joint and several liability (JSL) reform	NR	NR	joint and several liability reform is likely to increase medical liability pressure for medical providers as it makes doctors more accountable for their own errors, and thus a reduction in preventable medical complications is expected
Limitations on litigation					
CMPA, 2005 ⁶	Canada	Government indemnification with tort-based filter	this type of approach is in place in the UK and, by all accounts, is functioning well	NR	difficult to implement in the Canadian Federal-Provincial context, it could create issues related to territory and jurisdiction if run at the federal level and issues of efficiency and debt allocation if managed by the provinces
Domin, 2004 ¹⁵	California, USA	Statute of Limitations	promote greater certainty among insurance carriers in terms of their risk of liability for a given period of coverage, lending itself to premiums that more accurately	medical malpractice premiums for most of California's hospitals decreased by 25% in the years immediately	NR

			reflect the liability facing insurance companies when they provide coverage to obstetricians; withstood constitutional challenges	following MICRA's enactment	
Domin, 2004 ¹⁵	Louisiana, USA	Statute of Limitations	promote greater certainty among insurance carriers in terms of their risk of liability for a given period of coverage, lending itself to premiums that more accurately reflect the liability facing insurance companies when they provide coverage to obstetricians; withstood constitutional challenges	NR	NR
Domin, 2004 ¹⁵	New York, USA	Statute of Limitations	promote greater certainty among insurance carriers in terms of their risk of liability for a given period of coverage, lending itself to premiums that more accurately reflect the liability facing insurance companies when they provide coverage to obstetricians; withstood constitutional challenges	NR	NR
van Boom, 2007 ³¹	France	reform of French health law	NR	no definitive conclusions on the costs and benefits of this institution can be drawn	NR
Multi-component Model					
Bogue, 2013 ¹³	Massachusetts, USA	Massachusetts Health Care Cost Containment Bill of 2012	A system that encourages productive physician-patient conversation will ease the pressure on both parties when these situations arise. If direct costs and the number of suits can be reduced because of disclosure and apology, then physicians will not feel obligated to practice defensively, as they now do in Massachusetts. Malpractice reforms will have the largest impact on health care costs if they can inspire physicians to stop ordering unnecessary tests and services purely to avoid malpractice suits. The Cost Bill does not require patients to waive any legal rights	The Cost Bill seeks to change many aspects of Massachusetts' current health care delivery system in an effort to cut \$200 billion in health care spending	Notice period and apology program might act as roadblocks for plaintiffs. Both organizations (Massachusetts Bar Association, Massachusetts Trial Attorneys Association) testified before the Massachusetts Health Care Finance Committee that the language declaring physician statements of "mistake and error" inadmissible was overbroad and would prevent patients from entering valuable evidence during a trial. Additionally, they expressed skepticism as to whether the notice period will improve settlement rates or decrease claims, as well as concern that it may pose unnecessary delay in filing meritorious suits

			in order to pursue alternative remedies.		
Chow, 2007 ⁵²	USA	The Fair and Reliable Medical Justice Act of 2005 (i.e., health court model, caps on non-economic damages)	health court model abolishes the use of juries in medical malpractice cases and instead calls for review by full time judges who are "dedicated solely to addressing healthcare cases; these judges would have relevant background or gain expertise through handling medical malpractice cases exclusively; written rulings setting forth standard of care precedents would promote consistency across fact patterns; caps seek to maximize victim compensation by limiting attorney's fees to 20%; attempts to encourage the litigation of claims seeking lesser damages, by effectively lowering the litigation bar of \$ 200,000 through the lower cost per trial; a team of researchers from Common Good and the Harvard School of Public Health plans to propose a schedule for automatic compensation of noneconomic damages on an injury-specific basis to reimburse victims quicker and to establish more predictable victim compensation and prevention of medical errors for patient safety; Common Good claims that its procedure will significantly increase efficiency in terms of dispute resolution and compensation such that "most cases would be resolved within months.	more costly due to influx of claims that the current system weeds out	with a limited number of courts and a flood of claims, it is unclear how the courts would handle such an overwhelming caseload; the net effect of increased litigation could be a clogged docket, causing even longer payment delays than those found in the current system
Conroy, 2006 ¹⁴	USA	The Health Act 2005	NR	inconclusive	the effect of punitive damage caps on the rate of medical malpractice claims and insurer payouts remains indeterminate; Joint and Several Liability Reform: despite several studies, researchers have been unable to conclusively determine

					<p>what effect, if any, joint and several liability reform has had on malpractice premiums; Elimination or Reform of the Collateral Source Rule: research on the effect of the collateral source rule on malpractice premiums is also largely inconclusive. Some studies simply failed to isolate the effect of such reform from the effects of other reforms;</p> <p>Noneconomic Damage Caps: findings from states that impose noneconomic damage caps on jury verdicts show that these caps have failed to decrease or stabilize medical malpractice premiums; premiums grew faster in states that had enacted tort reform statutes than in states that did not enact such initiatives; caps also discourage plaintiffs' lawyers from representing members of vulnerable populations in the first place, further limiting these groups' ability to receive compensation for their harm.</p>
Gilmour, 2006 ³³	USA	limiting the size and risk of judgment	NR	caps on noneconomic damages reduced the average size of awards by 20 to 30%, but not the frequency of claims	have disadvantages for patient safety and equity considerations
Hull, 2005 ²⁵	California, USA	Medical Injury Compensation Reform Act (MICRA)	MICRA was effective in moderating premium increases compared to national average; reduced average settlement times and costs (settlements are 23% faster and the cost of settlement is 53% lower than the national average); improved the system's predictability	MICRA's \$ 250,000 noneconomic damage cap has reduced awards in excess of \$1 million to 1.31 awards per 1,000 physicians, less than the national average of 1.93 and almost half of the average in New York	NR
Hull, 2005 ²⁵	Texas, USA	Texas Alliance for Patient Access (TAPA)	NR	NR	NR
Liang, 2004 ²⁹	California, USA	MICRA	California physicians pay less in insurance premiums and California patients have greater access to healthcare; the total number of full-time, year-round	MICRA has been found to reduce healthcare costs by 5% to 9% without leading to increases in mortality or medical	the success of MICRA, however, is hardly conclusive, MICRA apparently failed to decrease the number of malpractice filings; current data show that California has a 50% higher frequency-of-

			practicing physicians grew five times faster than California's state population growth	complications	claims rate than the national average
Liang, 2004 ²⁹	Colorado, USA	Health Care Availability Act	Colorado's reform seems to be successful by the fact that the state has shown no discernible signs of healthcare affordability or accessibility problems	NR	although insurance providers profited handsomely after the tort reform, reduction in medical liability premiums due to the reform is uncertain
McAfee, 2005 ³⁰	USA	Bush's proposed tort reform	American Osteopathic Association believes that tort reform will increase patients' access to doctors in high risk practices; proponents of caps say that it stabilizes the insurance market, provide for affordable coverage, and assure that health care providers will buy coverage; it does not affect a plaintiff's ability to be fully compensated for economic damages	NR	many doubt that tort reform will solve doctors' insurance problems, for example, decreases in medical malpractice premiums was not attained in Florida with capped damages

Appendix 6. List of Referenced Reports

List of relevant reports referenced from included studies	
1	Currie, Janet, and W. Bentley MacLeod. First Do No Harm? Tort Reform and Birth Outcomes. No. w12478. National Bureau of Economic Research, 2006
2	Avraham R. An empirical study of the impact of tort reforms on medical malpractice settlement payments. <i>J Legal Studies</i> 2007;36:S183, S221
3	Nelson L, Morrisey M, Kilgore M. Medical malpractice reform in three southern states. <i>J Health Biomed L</i> 2008; 4:69, 139.
4	Studdert DM, Fritz LA, Brennan TA. The jury is still in: Florida's Birth-Related Neurological Injury Compensation Plan after a decade. <i>J Health Polit Policy Law</i> 2000;25: 499–526
5	Siegal G, Mello MM, Studdert DM. Adjudicating severe birth injury claims in Florida and Virginia: the experience of a landmark experiment in personal injury compensation. <i>Am J Law Med</i> 2008;34(4):493-537.
6	American Medical Association. 5 years of tort reform: Lone Star success story. Available at: http://www.ama-assn.org/amednews/2008/09/15/edsa0915.htm . Retrieved April 30, 2010;
7	Greenberg MD, Haviland AM, Ashwood JS, Main R. Is better patient safety associated with less malpractice activity? Evidence from California. RAND Institute for Civil Justice. Available at: http://www.rand.org/pubs/technical_reports/2010/RAND_TR824.pdf . Retrieved April 30, 2010
8	American Academy of Actuaries. Medical malpractice tort reform: lessons from the states. Available at: http://www.actuary.org/pdf/health/medmalp.pdf . Accessed November 15, 2004
9	Bovbjerg RR. Medical malpractice: problems & reforms-a policy-maker's guide to issues and information. Washington, DC: The Intergovernmental Health Policy Project, George Washington University; 1995
10	Bovbjerg RR. Legislation on medical malpractice: further developments and a preliminary report card. <i>UC Davis Law Rev</i> 1989;22(2):499-556
11	Thorpe KE. The medical malpractice "crisis": recent trends and the impact of state tort reforms. <i>Health Aff (Millwood)</i> ; January 21, 2004 [Epub ahead of print].
12	Zuckerman S, Bovbjerg RR, Sloan FA. Effects of tort reforms and other factors on medical malpractice insurance premiums. <i>Inquiry</i> 1990;27(2):167-82
13	Sloan FA, Mergenhagen PM, Bovbjerg RR. Effects of tort reforms on the value of closed medical malpractice claims: a microanalysis. <i>J Health Polit Policy Law</i> 1989;14(4):663-89
14	Danzon PM. The frequency and severity of medical malpractice claims: new evidence. <i>Law Contemp Prob</i> 1986;49(2):57-84
15	Danzon PM. The frequency and severity of medical malpractice claims. <i>J Law & Econ</i> 1984; 27(1):115-48
16	David G. Duff, Compensation for Neurologically Impaired Infants: Medical No-Fault in Virginia, 27 HARV. J. LEGIS. 391, 444 (1990)
17	Randall R. Bovbjerg & Frank A. Sloan, No-Fault for Medical Injury: Theory and Evidence, 67 U. CIN. L. REV. 53, 105 (1998)
18	Allen RH, Rosenbaum TC, Ghidini A, et al. Correlating head-to-body delivery intervals with neonatal depression in vaginal births that result in permanent brachial plexus injury. <i>Am J Obstet Gynecol</i> 2002;187:839–42
19	Gurewitsch E, Kim E, Yang JH, et al. Comparing McRoberts' and Rubin's maneuvers for initial management of shoulder dystocia: an objective evaluation. <i>Am J Obstet Gynecol</i> 2005;192:153–60
20	Gurewitsch ED, Allen RH. Fetal manipulation for management of shoulder dystocia. <i>Fetal and Maternal Medicine Review</i> 2006;17:239–80
21	Poggi SH, Stallings SP, Ghidini A, et al. Intrapartum risk factors for permanent brachial plexus injury. <i>Am J Obstet Gynecol</i> 2003;189:725–9
22	Poggi SH, Ghidini A, Allen RH, et al. Effect of operative vaginal delivery on the outcome of permanent brachial plexus injury. <i>J Reprod Med</i> 2003;48:692–6

23	Gurewitsch ED, Donithan M, Stallings S, et al. Episiotomy versus fetal manipulation in managing severe shoulder dystocia: a comparison of outcomes. <i>Am J Obstet Gynecol</i> 2004;191:911–6
24	Gurewitsch ED, Johnson E, Hamzehzadeh S, et al. Risk factors for brachial plexus injury with and without shoulder dystocia. <i>Am J Obstet Gynecol</i> 2006;194:486–92
25	Ken-ichi Yoshida, Report of Unusual Deaths and the Postmortem Inspection System, in <i>ENCYCLOPEDIA OF FORENSIC AND LEGAL MEDICINE</i> (2005);123-24
26	Interview with Chief Judge Wataru Murata and Judge Nozomu Hirano, Tokyo Dist. Ct., 34th Div. (Aug. 10, 2010) [hereinafter Tokyo Judges' 2010 Interview].
27	"Ili kan-sum Nosei Malli ni tai-surn Shiigai Hosllo Seido" 1080 Siiki /itsugen {Toward Prompt Institution of an "Injury Compensation System for Birth-Related Cerebral Palsy" 1080 NICHI-1 NYUSU 1 (Sept. 5, 2006), available at http://www.med.or.jp/nichinews/nl80905a.html (JMA publication quoting Dr. Takemi as favoring no-fault compensation for medical injury in 1972);
28	Japan MI'd. Ass'n, Iryo Jiko Chosa Seido no SOsctsu ni Mukcta Kihon teki Teigen ni tsuite (Basic Proposal for the Establishment of a Medical Accident Investigation System) 15-16 (2011), available at http://dLmcd.or.jp/dl.mcd/tcireikaikcn/20110713~.pdf (favoring no-fault compensation system).
29	The Florida system, like Virginia's Birth-Related Injury Fund, is a no-fault system for compensation of some serious neurological injuries sustained during or close to childbirth. For an overview of the two systems, see Sloan & Chepke, <i>supra</i> note 118, at 280-287.
30	Milland M, Christoffersen JK, Hedegaard M. The size of the labor wards: is bigger better when it comes to patient safety? <i>Acta Obstet Gynecol Scand.</i> 2013;92:1271–6.
31	Boothman RC, Blackwell AC, Campbell DA Jr, Commiskey E, Anderson S. A better approach to medical malpractice claims? The University of Michigan experience. <i>J Health Life Sci Law.</i> 2009;2(2):125–159.
32	Kachalia A, Kaufman SR, Boothman R, et al. Liability claims and costs before and after implementation of a medical error disclosure program. <i>Ann Intern Med.</i> 2010;153(4):213–221.
33	Mello M, Studdert D, Moran P, Dauer E. Policy experimentation with administrative compensation for medical injury: issues under state constitutional law. <i>Harv J Legis.</i> 2008;45(1):59–106
34	Robert Wood Johnson Foundation. Resolving medical malpractice cases in health courts—an alternative to the current tort system. http://www.rwjf.org/grants/product.jsp?id=66928 . Accessed November 1, 2010.
35	Quinn RE, Eichler MC. The 3Rs program: the Colorado experience. <i>Clin Obstet Gynecol.</i> 2008;51(4):709–718
36	Collins DE. Multidisciplinary teamwork approach in labor and delivery and electronic fetal monitoring education: a medical-legal perspective. <i>J Perinat Neonatal Nurs.</i> 2008;22(2):125–132
37	Mello M, Studdert D, Kachalia A, Brennan T. "Healthcourts" and accountability for patient safety. <i>Millbank Q.</i> 2006;84(3):459–492
38	Barringer P.Windows of Opportunity: State-Based Ideas for Improving Medical Injury Compensation and EnhancingPatient Safety. http://commongood.org/healthcare-reading-other-reports.html . Accessed November 1, 2010
39	Thanh NX, Jacobs P,Wanke MI et al. Outcomes of the introduction of the MOREOB continuing education program in Alberta. <i>J Obstet Gynaecol Can</i> 2010; 32: 749–755
40	Knox GE. High reliability perinatal units: an approach to the prevention of patient injury in medical malpractice claims. <i>J Healthc Risk Manag</i> 1999; 19: 27–35
41	Bailey A & Gillis L. High impact evaluation: a new learning evaluation model: forward-looking, predictive and proactive. <i>Can Learn J</i> 2011; (Fall): 13–17
42	Mann S, Pratt S, Gluck P, et al. Assessing quality in obstetrical care: development of standardized measures. <i>Jt Comm J Qual Patient Saf</i> 2006;32 [in press]
43	Blumenthal D. Total quality management and physicians' clinical decisions. <i>JAMA.</i> 1993;269:2775–2778.
44	Blumenthal D. Making medical errors into 'medical treasures.' <i>JAMA.</i> 1994;272:1867–1868.
45	Gaba DM. Anesthesiology as a model for safety in healthcare. <i>BMJ.</i> 2000;320:785–788.
46	Gluck PA. Patient safety: a new imperative. <i>ACOG Clin Rev.</i> 2001;6:1.

47	Lagasse RS. Anesthesia safety: model or myth? A review of the published literature and analysis of current original data. <i>Anesthesiology</i> . 2002; 97: 1609–1617
48	Leape LL. Error in medicine. <i>JAMA</i> . 1994;272:1851–1857.
49	Clark SL, Belfort MA, Byrum SL, Meyers JA, Perlin JB. Improvement outcomes, fewer caesarean deliveries, and reduced litigation: results of a new paradigm in patient safety. <i>Am J Obstet Gynecol</i> . 2008;199:105.e1–105.e7.
50	Grunebaum A, Chervenak S, Skupski D. Effect of a comprehensive obstetric patient safety program on compensation payments and sentinel events. <i>Am J Obstet Gynecol</i> . 2011;204:97–105.
51	Abuhamad A, Grobman WA. Patient safety and medical liability: current status and an agenda for the future. <i>Obstet Gynecol</i> . 2010;116:570–577.
52	Clark SL, Belfort MA, Dildy GA, Meyers JA. Reducing obstetric litigation through alterations in practice patterns. <i>Obstet Gynecol</i> 2008;112: 1279-83
53	Pettker CM, Thung SF, Norwitz ER, et al. Impact of a comprehensive patient safety strategy on obstetric adverse events. <i>Am J Obstet Gynecol</i> 2009;200:492.e1-8
54	Hines S , Luna K , Lofthus J , Marquardt M , Stelmokas D . Becoming a High Reliability Organization: Operational Advice for Hospital Leaders . (Prepared by the Lewin Group under Contract No. 290–04–0011.)
55	AHRQ Publication No. 08–0022 . Rockville, MD : Agency for Healthcare Research and Quality ; April 2008
56	Main EK, Morton CH, Melsop K et al. Creating a public agenda for maternity safety and quality in caesarean delivery. <i>Obstet Gynecol</i> 2012
57	Gregory KD, Jackson S, Korst L & Fridman M. Cesarean versus vaginal delivery: whose risks? Whose benefits? <i>Am J</i>
58	Cass NM. Medicolegal claims against anaesthetists: a 20 year study. <i>Anaesth Intensive Care</i> 2004; 32: 47–58
59	Cheney FW. The American Society of Anesthesiologists closed claims project: the beginning. <i>Anesthesiology</i> 2010; 113:957–960.
60	Ericksen M. The Danish patient insurance scheme. In: Administrative approaches to compensating for medical injuries: national and international perspective conference, October 31, 2005 in Washington, DC. Co-hosted by Common Good and the Harvard School of Public Health. Washington, DC: Common Good
61	Espersson C. The Swedish patient injury act. In: Administrative approaches to compensating for medical injuries: national and international perspective conference, October 31, 2005 in Washington, DC. Co-hosted by Common Good and the Harvard School of Public Health. Washington, DC: Common Good
62	Florida Birth-Related Neurological Injury Compensation Association. NICA-Florida’s innovative alternative to costly litigation. Available at: http://www.nica.com/what-is-nica.html . Retrieved March 5, 2010
63	Florida Birth-Related Neurological Injury Compensation Association. Eligibility and benefits. Available at: http://www.nica.com/eligibility_benefits.html . Retrieved March 5, 2010.
64	Florida Birth-Related Neurological Injury Compensation Association. General: frequently asked questions. Available at: http://www.nica.com/faq.html . Retrieved March 5, 2010.
65	Florida Birth-Related Neurological Injury Compensation Association. OBGYNs: the freedom to focus on patient care. Available at: http://www.nica.com/obgyns/index.html . Retrieved March 5, 2010.
66	Virginia Birth-Related Neurological Injury Compensation Program. Eligibility benefits & claims. Available at: http://www.vabirthinjury.com/Eligibility_Benefits.htm . Retrieved March 5, 2010.
67	Virginia Birth-Related Neurological Injury Compensation Program. General information/frequently asked questions. Available at: http://www.vabirthinjury.com/FAQ.htm . Retrieved March 5, 2010.
68	U.S. Department of Health and Human Services. Evaluation of early offer reform of medical malpractice claims: final report. Washington, DC: HHS; 2006. Available at: http://aspe.hhs.gov/daltcp/reports/2006/medmalcl.pdf . Retrieved March 5, 2010.
69	Caps on damages in medical malpractice lawsuits would reduce healthcare costs, McClellan says. <i>Medical News Today</i> . Available at: http://www.medicalnewstoday.com/articles/23639.php .

70	Hamm WG, Wazzan CP, Frech HE. MICRA and Access to Healthcare. California's MICRA Reforms: Increasing the Cap on Non-Economic Damages Would Increase the Cost of, and Reduce Access to, Healthcare. Available at: http://www.micra.org/patientaccess/docs/micra_study_ca_micra_reforms.pdf .
71	Hellinger FJ, Encinosa WE. The impact of state laws limiting malpractice awards on the geographic distribution of physicians. U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality Web site. Available at: http://www.ahrq.gov/research/tortcaps/tortcaps.pdf .
72	Hellinger FJ, Encinosa WE. The impact of state laws limiting malpractice damage awards on healthcare expenditures. <i>Am J Public Health</i> . 2006;96:1375–1381.
73	Hull MS, Cooper RB, Bailey CW, Wilcox DP, Gadberry GJ, Wallach MD. House Bill 4 and Proposition 12: An Analysis with Legislative History. <i>Texas Tech Law Review</i> . 2005;36:169–322.
74	Kessler DP, Sage WM, Becker DJ. Impact of malpractice reforms on the supply of physician services. <i>JAMA</i> . 2005;293: 2618–2625
75	Liability for Medical Malpractice: Issues and Evidence. Joint Economic Committee. Washington, DC: U.S. Government Printing Office; 2003
76	Proposition 12 Produces Healthy Benefits. Available at: http://www.texmed.org/Template.aspx?id=5238 . Accessed April 24, 2008.
77	NHSLA. Clinical Negligence Scheme for Trusts Maternity Clinical Risk Management Standards April 2006.