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## **Medical Specialties at High Risk of Litigation in Iran, 1991-2011: A Systematic Review of 24 Studies**

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We attempt to review all databases from which data on medical malpractices and complaints on Iranian health system were presented. We systematically searched PubMed, Medline, four national databases and hand-searched three relevant journals from 1991 to 2011. After quality appraisal, data was extracted from the literature and analyzed using qualitative synthesis approach. Twenty-four reports on the medical malpractice in various medical specialties, dentistry and pharmacy were reviewed. A total of 8394 complaints out of 16584 cases were found related to medical malpractice in Iran from 1991-2011. The highest number of medical malpractice reported, were from the capital city following by eastern north part and central part of Iran. The highest risk of medical liability lawsuits were observed in obstetrics and gynecology, orthopedy, general surgery and ophthalmology. Studies only focused on some elements of the problem and rarely on process-related or systematic causes of malpractice and medical errors. There is substantial variation in the likelihood of malpractice suits across specialties. Despite considerable financial impacts of healthcare fraud and malpractice, this aspect of the problem had received even less attention.

**Key words:** Professional misconduct, malpractice, specialties, medical error, medical negligence, medical litigation

## INTRODUCTION

Medical malpractices lawsuits may increase the health care expenditure, resulting in many doctors attempt to protect themselves from the increasing threat of liability suits by changing their methods of practicing medicine. In particular, this type of claims may divert health care professional's resources and time away from their foremost purposes, which is providing the patient care (Zuckerman, 1984).

When a claim occurs, health care professionals are forced to devote some time and effort to the legal issues and, in many cases, obtain a legal consultant. These elements contribute in raising the cost of medical practice and, as with premiums, can translate into higher charges of healthcare services. Over the past decade, health care professional and researchers have claimed that defensive medicine is the most destructive consequence of the medical malpractices lawsuits. Numerous researchers have committed or observed a relationship between concerns about the risk and costs of medical negligence, overall malpractice effect on health care environment and defensive performance (Dubay *et al.*, 1999; Localio *et al.*, 1993; Vimercati *et al.*, 2000a, b). Hence, others reported that medical malpractices lawsuits would not significantly influence medical and health care decision-making (Sloan and Shadle, 2009).

Although health care professionals may implement defensive medicine due to fear of litigation, but this may also cause health care professionals to accomplish medically unnecessary tests and treatment in their best professional judgments. As health care costs are increasing and insurance coverage remains to shrink, many people worldwide have begun to surprise where the health system went wrong.

Two significant contributing factors in rising health care costs include medical malpractice and defensive medicine.

To the best of our knowledge, though there are many scientific attempts to assess the malpractice in Iran, but no one observed the medical specialties at high risk of litigation in Iran. So, the aim of this review was to assess the medical specialties at high risk of litigation in Iran, with clinically malpractice issues. All the available published data on the subject matter were pooled together in a systematic review.

## MATERIALS AND METHODS

**Search strategy:** We searched PubMed and Medline using MeSH terms including "defensive medicine", "Malpractice", "legislation and jurisprudence", "Medical

complaints", "Medical claims" and "Iran", in following sequential form: (((("Defensive Medicine"[Mesh]) OR "Malpractice"[Mesh]) AND "legislation and jurisprudence" [Subheading]) AND "Iran"[Mesh]). Besides, we searches four local databases include IranMedex, IranDoc, SID (Scientific Information Database) and Magiran using same search terms in both English and Persian languages. The PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guideline was followed (Moher *et al.*, 2009).

**Inclusion criteria:** All the studies about medical malpractice in the medical fields including general practice, specialties, dentistry, pharmacy and other were collected.

**Data extraction:** The extracted data included study characteristics such as medical specialty, number of claims that stratified to different specialties and geographical region.

**Outcome measures:** The primary endpoint variable for this systematic review was malpractice in the physician groups. Outcome data on medical negligence, the cost of malpractice and type of high-risk medical fields were retrieved.

**Statistical analysis:** The frequencies of different lawsuits were presented and the results were expressed as number and percentage. All data were analyzed using Microsoft Excel 2010 and STATA 11.0.

## RESULTS

Twenty-four reports on the medical malpractice in various medical specialties were reviewed (Fig. 1) (Akhlaghei *et al.*, 2004; Badakhsh, 2003; Bazrafkan *et al.*, 2008; Daneshparvar and Javadian, 2008; Ghashlaghei *et al.*, 2009; Haghghi *et al.*, 2005, 2006; Haghshenas *et al.*, 2012; Hedayati *et al.*, 2012; Hejazi *et al.*, 2009; Jafarian *et al.*, 2009; Kiani and Sheikhezadi 2009; Mahfouzi and Zamani, 2007; Manouchehri Moghadam *et al.*, 2010; Mirza Aghaei *et al.*, 2011; Moin *et al.*, 2011; Naghibi *et al.*, 2011; Parhizgar and Fayaz, 2005; Zavareh *et al.*, 2007; Saberi *et al.*, 2009; Sadr *et al.*, 2006; Shahsavari *et al.*, 2010; Siabani *et al.*, 2009). A total of 8394 complaints out of 16584 cases were found related to medical malpractice in Iran that the details are given in Table 1. Total malpractice cases appear to have jumped markedly, from 74 cases in 1991 to 822 and 724 cases in 2003 and 2007, respectively (Fig. 2). The highest number

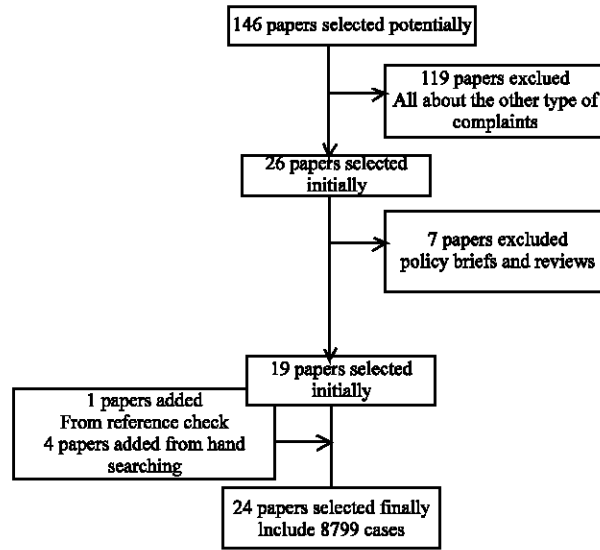


Fig. 1: Flowchart of eligible studies

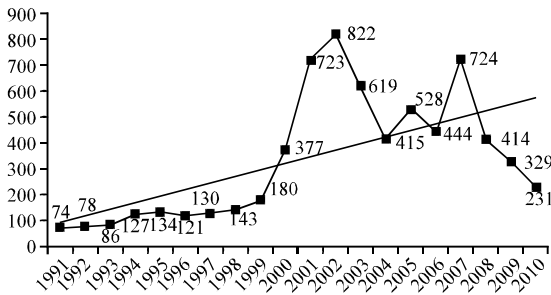


Fig. 2: The trend of aggregated number of medical malpractice complaints in different year based on the available literature

of medical malpractice reported cases account for 13412/16584 (80.89%), were from Tehran (the capital city), following by Mashhad (eastern north part) and Isfahan (central part) of Iran with the values of 1148/16584 (6.9%) and 965/16584 (5.8%), respectively (Fig. 3). The stratification of malpractice cases by the medical fields, revealed that the majority of cases were about various medical specialties 5922 (69.1%), followed by 1049 (12.49%) and 1003 (11.94%), for dentists and general practitioners, respectively (Table 2). Of 8394 cases of complaints related to general practitioners, medical specialties, dentists and pharmacists, 8065 cases from 17 studies were about ten different specialties exposed to lawsuits. Consequentially, the highest risk of medical liability lawsuits were observed in obstetrics and

gynecology, orthopedy, general surgery and ophthalmology account for of 10.43% (841), 8.98% (724), 5.69% (459) and 4.84% (390), respectively (Fig. 4).

## DISCUSSION

This is the first comprehensive review regarding the medical malpractice presented among board certified expert physicians from ten different medical disciplines and other medical field experts such as general practitioners, dentists and pharmacists, from Iran. In the current review, we included three major disciplines of medicine and ten specialties that are at greater risk of litigation in a time period of 20-year, from 1991 to 2010. Our study was not limited to a certain area or a single specialty, nor was it limited to high risk or low risk specialists alone.

Creating solutions to reduce the medical malpractice is a challenging duty, mainly because reliable empirical evidence on the subject remains limited. One of the suggested solutions is defensive medicine, which may reduce access to care and even risk of physical suffering or harm (Cohen and Eisenberg, 2002; Michota and Donnelly, 2009; Tippett, 2010; Weisman *et al.*, 1988). Among high-risk specialist physicians in our study, the highest risk of medical liability lawsuits were observed in obstetrics and gynecology, orthopedy, general surgery and ophthalmology, while Studdert *et al.* (2005) studied the prevalence and characteristics of defensive medicine among six specialties at high risk of litigation including

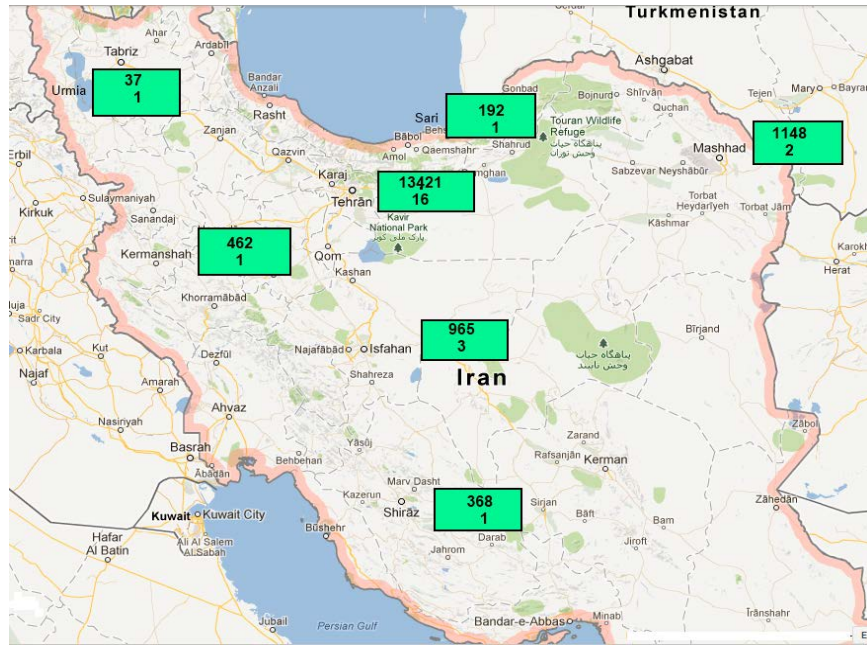


Fig. 3: In each box, Top, The aggregated number of medical malpractice complaints in different cities of Iran based on the available literature; Down, The number of studies from each city in Iran

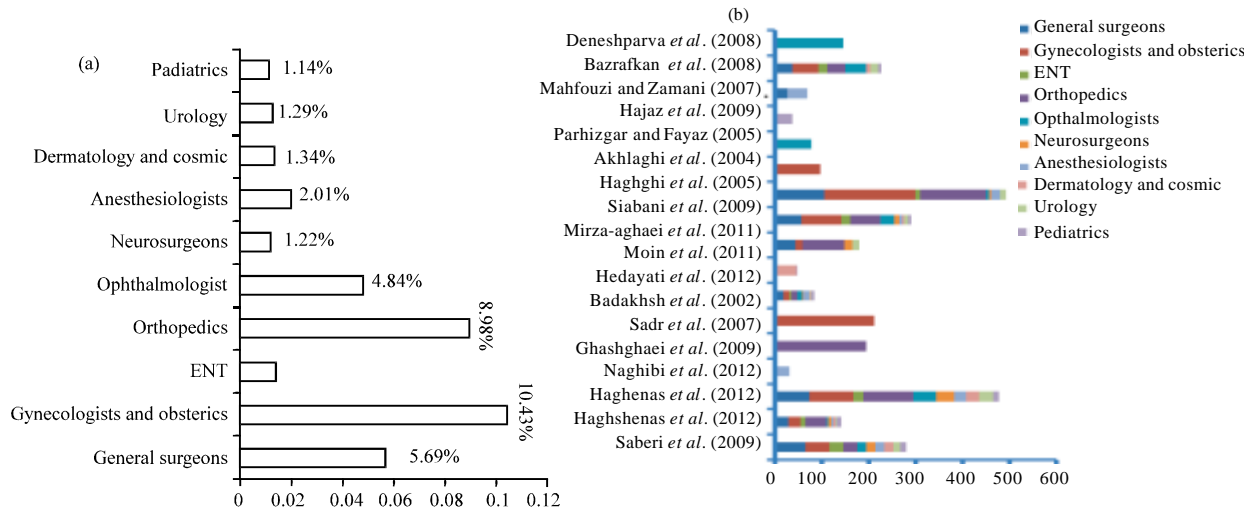


Fig. 4(a-b): (a) Percentage of board certified physicians (n = 8065) exposed to lawsuits in each of the ten studied specialties, (b) Stratification of certified physicians (n = 8065) exposed to lawsuits in each of the ten studied specialties based on each single study

emergency medicine, general surgery, orthopedic surgery, neurosurgery, obstetrics/gynecology and radiology (Studdert *et al.*, 2005). Moreover, other recent study reported that the most specialty at high risk of litigation was obstetrics/gynecology following by neurosurgery, general surgery, orthopedics and family medicine (Asher *et al.*, 2012).

The care experience survey data and available literature might be useful for managing individual physician malpractice risk, but available evidence is limited. Rodriguez *et al.* (2008) assessed whether patients' experiences with individual physicians, as measured by a validated survey, are associated with patient complaints and malpractice lawsuits. The

Table 1: The available Literature about medical malpractice

| Author, year                      | Area       | Total files | Type of clinical practice (No.)   | No. of complaints |           |                         |
|-----------------------------------|------------|-------------|---|-------------------|-----------|-------------------------|
|                                   |            |             |   | No complaint      | Justified | Time period             |
| Saberi <i>et al.</i> (2009)       | Tehran     | 385         | General practitioner (35)<br>Specialist (308)<br>Dentist (31)<br>Other(11)                    | 275               | 110       | One-year 2007           |
| Kiani and Sheikhzadi (2009)       | Tehran     | 285         | Dentist   | 201               | 84        | Five-year 2002-2006     |
| Haghshenas <i>et al.</i> (2012)   | Sari       | 192         | General practitioner (9)<br>Pharmacist (3)<br>Specialist (155)<br>Dentist (19)<br>Other(6)    | 140               | 52        | Six-year 2006-2011      |
| Manouchehri                       |            |             |   |                   |           |                         |
| Moghadam <i>et al.</i> (2010)     | Tehran     | 1642        | Specialist: cardiologist  | 128               | 1514      | Two-year 2005-2006      |
| Jafarian <i>et al.</i> (2009)     | Tehran     | 832         | General practitioner Dentist  | 691               | 146       | Three-year 91, 96, 2001 |
| Naghibi <i>et al.</i> (2011)      | Isfahan    | 811         | General practitioner (136)<br>Specialist (519)<br>Pharmacist (9)<br>Dentist (82)<br>Other(65) | 649               | 162       | Three-year 2006-2008    |
| Ghashlaghei <i>et al.</i> (2009)  | Isfahan    | 31          | Specialist : Anesthesiologist   | 8                 | 23        | Five-year 2000-2004     |
| Sadr <i>et al.</i> (2006)         | Tehran     | 965         | Specialist (196) : Orthopedic   | 119               | 77        | Six-year 1999-2004      |
| Badakhsh (2003)                   | Tehran     | 1537        | Specialist: obstetrics<br>and gynecology (213)  | 127               | 86        | Five-year 1991-1996     |
| Hedayati <i>et al.</i> (2012)     | Isfahan    | 123         | General practitioner (19)<br>Specialist (95)<br>Pharmacist (2)<br>Dentist (7)                 | 61                | 62        | Five-year 2006-2010     |
| Moin <i>et al.</i> (2011)         | Tehran     | 82          | General practitioner (34)<br>Specialist (48)  | 30                | 50        | Nine-year 2002-2010     |
| Mirza Aghaei <i>et al.</i> (2011) | Tehran     | 322         | General practitioner (67)<br>Specialist (215)<br>Other (40)                                   | 234               | 88        | Two-year 2008-2009      |
| Siabani <i>et al.</i> (2009)      | Kermanshah | 426         | General practitioner (52)<br>Specialist (361)<br>Other (13)                                   | 248               | 178       | Five-year 2001-2005     |
| Haghghi <i>et al.</i> (2005)      | Mashhad    | 1057        | Specialist: general surgeon (493)   | 394               | 99        | Five -years 1999-2003   |
| Zavareh <i>et al.</i> (2007)      | Tehran     | 2537        | General practitioner (110)  | 50                | 60        | Three-year 2004-2006    |
| Akhlaghei <i>et al.</i> (2004)    | Tehran     | 768         | Specialist: obstetrics and<br>gynecology (97)   | 56                | 41        | Two-year 2001-2002      |
| Haghghi <i>et al.</i> (2006)      | Mashhad    | 91          | Specialist: general surgeon (91)  | 82                | 9         | Five-year 2000-2004     |
| Parhizgar and Fayaz (2005)        | Tehran     | 79          | Specialist: Ophthalmology   | 67                | 12        | Four-year 2000-2003     |
| Hejazi <i>et al.</i> (2009)       | Uromyeh    | 37          | Specialist: Pediatrics  | 29                | 8         | Ten-year 1996-2006      |
| Mahfouzi and Zamani (2007)        | Tehran     | 70          | Specialist : Anesthesiologist   | 27                | 43        | Ten-year 1993-2003      |
| Bazrafkan <i>et al.</i> (2008)    | Shiraz     | 368         | General practitioner (30)<br>Specialist (256)<br>Pharmacist (6)<br>Dentist (69)<br>Other (7)  | 273               | 95        | Five-year 2001-2005     |
| Shahsavari <i>et al.</i> (2010)   | Tehran     | 1237        | Dentist (272)   | 171               | 101       | Eight-year 2001-2008    |
| Daneshparvar and Javadian (2008)  | Tehran     | 1581        | Specialist: Ophthalmology<br>(147)  | 116               | 31        | Three-year 2003-2005    |
| Jafarian <i>et al.</i> (2009)     | Tehran     | 1090        | General practitioner (95)<br>Specialist (584)<br>Dentist (153)<br>Other (258)                 | 944               | 146       | Three-year 2000-2002    |

showed the challenges that face when attempting to use patient survey data to manage individual physician medical malpractice risk. Besides due to infrequent nature of lawsuits, calibrating these validated patient survey measures to malpractice lawsuit risk will require large physician samples from diverse practices (Rodriguez *et al.*, 2008).

Bratland and Hunskär assessed the predictability in the processing of complaints from patients against general practitioners and identified medical issues and situations prone to elicit complaints and possible reactions (Bratland and Hunskär, 2006). They claimed that the assessments of complaints made against physician are coherent and predictable and may be a source of learning

Table 2: No. of complaints in different group of physicians

| Authors                                   | General practitioner | Specialist   | Dentist      | Pharmacist | Other      | Settlements | Judgments   |
|---|----------------------|--------------|--------------|------------|------------|-------------|-------------|
| Saberi <i>et al.</i> (2009)               | 35                   | 308          | 31           | 0          | 11         | 275         | 110         |
| Kiani and Sheikhezadi (2009)              | 0                    | 285          | 0            | 0          | 0          | 201         | 84          |
| Haghshenas <i>et al.</i> (2012)           | 9                    | 155          | 19           | 3          | 6          | 140         | 52          |
| Manouchehri Moghadam <i>et al.</i> (2010) | 0                    | 1642         | 0            | 0          | 0          | 1514        | 128         |
| Jafarian <i>et al.</i> (2009)             | 398                  | 0            | 434          | 0          | 0          | 691         | 141         |
| Naghbi <i>et al.</i> (2011)               | 136                  | 519          | 82           | 9          | 65         | 649         | 162         |
| Ghashlaghei <i>et al.</i> (2009)          | 0                    | 31           | 0            | 0          | 0          | 8           | 23          |
| Sadr <i>et al.</i> (2006)                 | 0                    | 196          | 0            | 0          | 0          | 119         | 77          |
| Badakhsh 2003                             | 0                    | 213          | 0            | 0          | 0          | 127         | 86          |
| Hedayati <i>et al.</i> (2012)             | 19                   | 95           | 7            | 2          | 0          | 61          | 62          |
| Moin <i>et al.</i> (2011)                 | 34                   | 48           | 0            | 0          | 0          | 30          | 52          |
| Mirza Aghaei <i>et al.</i> (2011)         | 67                   | 215          | 0            | 0          | 40         | 234         | 88          |
| Siabani <i>et al.</i> (2009)              | 52                   | 361          | 0            | 0          | 13         | 248         | 178         |
| Haghghi <i>et al.</i> (2005)              | 0                    | 493          | 0            | 0          | 0          | 394         | 99          |
| Zavareh <i>et al.</i> (2007)              | 110                  | 0            | 0            | 0          | 0          | 50          | 60          |
| Akhlaghei <i>et al.</i> (2004)            | 0                    | 97           | 0            | 0          | 0          | 56          | 41          |
| Haghghi <i>et al.</i> (2006)              | 0                    | 91           | 0            | 0          | 0          | 82          | 9           |
| Parhizgar and Fayaz (2005)                | 0                    | 79           | 0            | 0          | 0          | 67          | 12          |
| Hejazi <i>et al.</i> (2009)               | 0                    | 37           | 0            | 0          | 0          | 29          | 8           |
| Mahfouzi and Zamani (2007)                | 0                    | 70           | 0            | 0          | 0          | 27          | 43          |
| Bazrafkan <i>et al.</i> (2008)            | 30                   | 256          | 69           | 6          | 7          | 273         | 95          |
| Shahsavari <i>et al.</i> (2010)           | 0                    | 0            | 272          | 0          | 0          | 171         | 101         |
| Daneshparvar and Javadian (2008)          | 0                    | 147          | 0            | 0          | 0          | 116         | 31          |
| Jafarian <i>et al.</i> (2009)             | 95                   | 584          | 153          | 0          | 258        | 944         | 146         |
| Total (%)                                 | 1003 (11.94)         | 5922 (70.55) | 1049 (12.49) | 20 (0.24)  | 400 (4.78) | 6506 (77.5) | 1888 (22.5) |
| All                                       | 8394                 | 8394         |              |            |            |             |             |

from mistakes. B-Lynch *et al.* (1996) evaluated the common causes of medico-legal dispute and assessed the potential benefit of early alternative dispute resolution and recommended recruiting independent, experienced and unbiased consultants in active practice within the appropriate specialty to review such cases at the level of hospital complaints management as an in house review procedure, particularly for small and moderate-sized claims.

Many malpractice reviews offer an opportunity for the study of the properties of different practice patterns, thus in the field of obstetrics/gynecology, the usefulness of such approach has been verified repeatedly. Consequently, in a review that published by Iffy and McArdle, they assessed the role of medico-legal reviews in medical research. They claimed that there is reason to anticipate that objective evaluation of the background of other prenatal birth injuries can provide more useful clinical information than traditional randomized prospective studies (Iffy and McArdle 1996). Jena *et al.* (2011) analyzed malpractice data from 1991 through 2005 for all physicians who were covered by a large professional liability insurer with a nationwide client base from USA and reported the proportion of physicians facing a claim each year ranged from 19.1% in neurosurgery, 18.9% in thoracic-cardiovascular surgery and 15.3% in general surgery to 5.2% in family medicine, 3.1% in pediatrics and 2.6% in psychiatry.

Recently, Brasme *et al.* (2012) systematically reviewed the distribution, determinants and consequences of time to diagnosis of pediatric malignancies and compared these findings with those of court-appointed expert witnesses in malpractice claims, which showed the relations between delay in diagnosis and outcome are complex and probably depend more on tumor biology than on parental or medical factors (Brasme *et al.*, 2012).

Pegalis and Bal (2012) investigated whether physician groups have examined the data about closed claims related to medical negligence identify error patterns and to then institute specific patient treatment protocols. They showed that safety guidelines derived from analyzing past medical malpractice litigation can achieve the same goals while also promoting patient safety.

## CONCLUSION

Studies only focused on some elements of the problem and rarely on process-related or systematic causes of malpractice and medical errors. Studies that focused on medical criminal offences did not discuss potential legal limitations. Despite considerable financial impacts of healthcare fraud and abuse, this aspect of the problem had received even less attention.

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