



OPEN Surgical specialists face higher a risk for malpractice compared to their non-surgical colleagues

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In previous studies, surgical specialties accounted for most malpractice claims. The objective of the present study was to determine the risk for malpractice claims for physicians working in hospitals. A retrospective observational study using anonymized closed malpractice claims between 2007 up to 2021 from two Dutch insurers was carried out. Main outcomes involved claim volume & outcome, and the estimated annual risk (EAR) for a claim per year for the individual physician from all specialties. Sustained or settled claims were considered unfavorable for the physician (UOP). Surgical specialists, involving surgical specialties and specialties with surgical characteristics accounted for 77% (14,330/18,649) of the claims closed. Liability was denied in 51% of the claims ($n=9,487$). The remaining claims were sustained (granted) ($n=4,600$; 25%), settled ($n=3,444$; 18%) or closed without decision ($n=1118$; 6%). Surgeons faced an average EAR of 21.6% (range 6.5 – 28%) which was higher compared to colleagues from specialties with surgical characteristics (EAR 7.3%; range 2.9 – 10.1%) and non-surgical specialties (EAR 2.5%; range 0.9 – 4.4%). Surgical specialists received more claims than their non-surgical colleagues. Relative to specialty size, surgeons faced a higher risk for a claim in general, as well as for a claim with an unfavorable outcome.

Keywords Claim, Health law, Malpractice, Medical litigation, Negligence, Surgery

Physicians exposed to malpractice litigation and patients' complaints tend to practice more defensive medicine and suffer from increased stress and burn-out symptoms^{1,2}.

In medical malpractice claims compensation is sought for damages suffered during care. The number of claims varies among specialties and countries^{3,4}. Over the past decades, the financial burden has increased in several countries, including the Netherlands⁵. Previous studies have reported on the prevalence and patient payout^{3,4,6–8}. Although this has brought some insight into the trends and magnitude of claims among several medical specialties, only one study compared medical specialties by acknowledging their specific characteristics such as surgical vs. non-surgical or number of physicians per specialty⁹. To calculate the risk of a claim for the individual specialist, the number of claims must be related to the number of specialists and their clinical activities¹⁰.

The present study analyses closed malpractice claims in the Netherlands during a 15-year period of all medical specialties nationwide. The study addresses the estimated annual risk for a malpractice claim for the individual physician from all specialties.

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Materials and methods

Dutch health law system & assessment of liability

In the Netherlands, patients who are unsatisfied with the medical treatment they receive have various ways to express this. Malpractice claims are generally based on article 6:74 of the Dutch Civil Code (DCC), that is to say, a 'failure to correctly comply with a contractual obligation' or article 6:162 DCC, meaning an extra-contractual 'wrongful act'. Most claims related to a 'failure to comply with a contractual obligation' are submitted and handled in an out-of-court setting. In contrast, malpractice claims related to a 'wrongful act' are generally submitted to a civil court seeking redress from the responsible healthcare professional or hospital¹¹.

Under Dutch law, there is only an obligation to pay damages in case of harm that occurred due to a mistake by a healthcare professional that was not otherwise caused or excusable. Care, or lack of care, that results in damage does not automatically lead to financial liability. It is for the plaintiff to provide evidence that a mistake took place and that this caused financial or emotional harm. In situations where a patient requests financial compensation, the liability assessment is first examined by the malpractice insurer of the hospital. Both the malpractice insurer and plaintiff can invite a medical expert to assess the presence and extent of negligence.

Data source, -privacy and -handling, and ethical board approval

Data from Centramed and MediRisk, the two largest insurers for medical malpractice claims in the Netherlands, were included. Together, these insurers cover over 85% of all Dutch hospitals. Claims against physicians from hospitals insured by these insurers between January 1st, 2007, and December 31st, 2021, were included in our study. After a careful review and formal permission from the boards of Centramed and MediRisk, WD and JS were granted access to claim data for a limited period of time (January 1st 2022 – April 30th 2022). The insurers anonymized claim data before extraction. Individual participant informed consent did not apply. Ethical board review was waived for the present study (METC 2020–0972) by the Ethics committee of the Erasmus Medical Centre, Rotterdam, the Netherlands.

Data collection

The scope of the present retrospective cohort study was limited to malpractice claims that were closed between January 1st, 2007, and December 31st, 2021. Surgical specialists involved physicians from the surgical specialties General Surgery, Orthopedic Surgery, Plastic- and Reconstructive Surgery, Neurosurgery, Oral-Maxillofacial Surgery, and Cardio-Thoracic Surgery as well as physicians from specialties with surgical characteristics, involving Obstetrics & Gynecology, Urology, Otolaryngology, Ophthalmology and Dermatology. Non-surgical specialties involved Internal Medicine, Cardiology, Neurology, Anesthesiology, Pulmonology, Gastroenterology, Intensive Care Medicine, Pediatrics, Radiology & Nuclear Medicine, and Pathology. Claims against General Practitioners, Psychiatrists, Elderly Medicine Physicians, Pharmacists, Dentists, Nurses and other hospital personnel were excluded, as well as claims in which the specialty or claim outcome were missing.

Data were collected on specialty (surgical, surgical characteristics, and non-surgical), claim volume, total financial burden and patient payout. Malpractice claims were categorized per surgical specialty. Following the European General Data Protection Regulation (GDPR), plaintiffs' and defendants' age and sex were not analyzed. A claim could either be sustained (granted), denied, settled without acknowledgment of liability, or closed without a decision by the insurer.

Statistical analysis

Continuous variables are provided as means \pm standard deviations, or, in case of non-normally distributed variables, median and interquartile range (IQR), and categorical variables as numbers (percentages). Descriptive statistics were performed for all variables. Claim volume, financial burden, and patient payout were reported for all surgical specialties. Claim outcome was dichotomized as 'favorable outcome for physician' (FOP), which included claims that were denied or closed without a final decision, and 'unfavorable outcome for physician' (UOP), which included sustained or settled claims. A FOP: UOP-ratio was calculated per type of specialty and individual medical specialty for comparative purposes through dividing the number of claims with a favorable outcome by the number of claims with an unfavorable outcome. A FOP: UOP-ratio $> 1,0$ indicates an increased likelihood for claims with a favorable outcome for the physician. The annual number of registered physicians per specific specialty served as specialty size indicator¹². An estimated annual risk (EAR) was calculated to determine the annual risk for the individual specialist per year per specialty type and individual medical specialty. The EAR (expressed as a percentage) for a claim for the individual physician was calculated by the total number of claims for a particular specialty divided by the number of years studied (15 years), divided by the average annual number of registered physicians for that specific specialty. For example, an EAR of 10% should be interpreted as a 10% chance that a physician receives a claim in a given year.

Results with a P value < 0.05 were considered statistically significant. All analyses were performed using IBM SPSS, version 28 (IBM Corp, Armonk, NY, USA). Costs were reported in Euros (€) and converted in Dollars (\$) according to the exchange rate for a particular year¹³.

Results

Malpractice claims characteristics

A total of 21,845 claims were closed of which 18,649 claims were included in the present study (Fig. 1). Physicians from surgical specialties accounted for 10,443 (56%) claims compared to 3,887 (21%) claims against physicians from specialties with surgical characteristics, and 4,319 (23%) claims against physicians from non-surgical specialties (Supplementary Table 1).

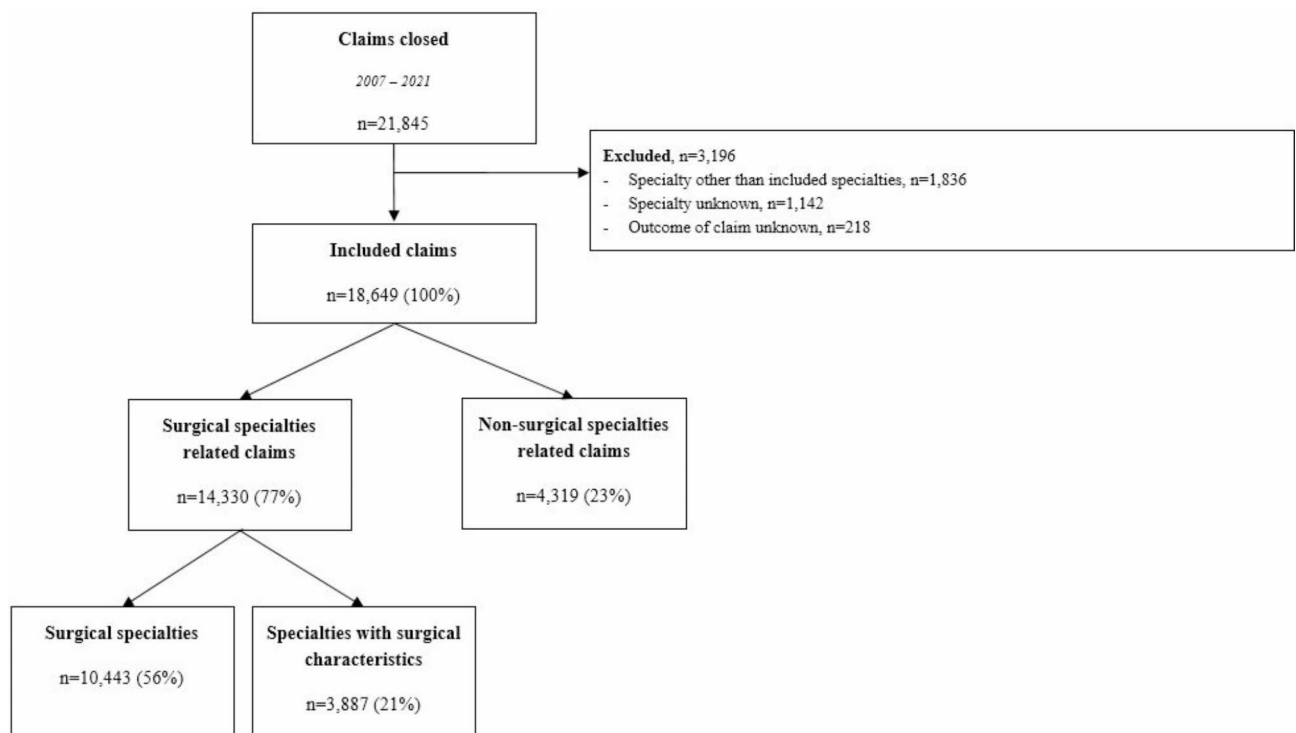


Fig. 1. Flowchart of included claims.

Overall, liability was denied in 9,487 (51%) of all claims. An unfavorable outcome for physicians was reported in 8,044 (43%) claims of which 4,474 (56%) claims involving surgical specialties, 1,659 (9%) claims involving specialties with surgical characteristics, and 1,911 (10%) claims involving non-surgical specialties.

Most claims were closed in General Surgery ($n=4,897$; 26%), followed by Orthopedic Surgery ($n=3,480$; 19%), and obstetrics & gynecology ($n=1,723$; 9%). The least number of claims were filed against physicians practicing in Intensive Care Medicine ($n=63$; <1%), Cardio-Thoracic Surgery ($n=146$; <1%), and Pathology ($n=151$; <1%). Claims were most likely to be ruled in favor of the physician in Otolaryngology (FOP-UOP Ratio 2.09), followed by Neurosurgery (FOP-UOP Ratio 1.90) and Plastic Surgery (FOP-UOP Ratio 1.89). Claims were most likely to be ruled against the physician in Pathology (FOP-UOP Ratio 0.43), Radiology & Nuclear Medicine (FOP-UOP Ratio 0.92), and Oral & Maxillofacial Surgery (FOP-UOP Ratio 0.98).

The estimated annual risk per specialty type and individual specialty

For physicians in general, the estimated annual risk (EAR) for a claim was 6.5%, interpreted as “one claim every 15.4 years of practice” (Fig. 2; Supplementary Table 2). The EAR for a claim with an unfavorable outcome was 3.8%. Surgeons faced a higher EAR (21.6%; “one claim every 4.6 years of practice”) compared to physicians from specialties with surgical characteristics (EAR 7.3%; one claim every 13.7 years of practice”), but in particular compared to colleagues from non-surgical specialties (EAR 2.5%; one claim every 46.9 years of practice”). Taking the outcome into account, the EAR for a claim with an unfavorable outcome was 9.3% for surgeons, 3.1% for physicians practicing in specialties with surgical characteristics, and 1.0% for physicians from non-surgical specialties.

Orthopedic surgeons (28%; one claim every 3.5 years) faced the highest EAR, followed by General Surgeons (23%; one claim every 4.4 years) and Plastic Surgeons (17%; one claim every 6.0 years) resulting in the highest estimated number of claims per 30-year career (Fig. 3). In particular, physicians practicing in the fields of Pediatrics (EAR 0.9%; less than one claim per career), Internal Medicine (EAR 1.8; less than one claim per career), and Pathology (EAR 2.1%; less than one claim per career) were least likely to receive a claim.

Financial burden

The total financial burden of all claims was €M361 (\$M438). Surgical claims (€M257 [\$M312]) accounted for the greatest burden compared non-surgical specialties (€M104 [\$M126]). A detailed overview of financial aspects of claims per specialty is reported in supplement Table 3.

Discussion

Three quarters of the 18,649 closed malpractice claims between 2007 and 2021 were against surgical specialists. Adjusted for the number of registered physicians per specialty, surgeons faced an estimated annual risk of 21.6% (one claim every 4.6 years), which was a three-fold higher EAR compared to their colleagues practicing in specialties with surgical characteristics, and an eight-fold higher EAR than their non-surgical colleagues. In

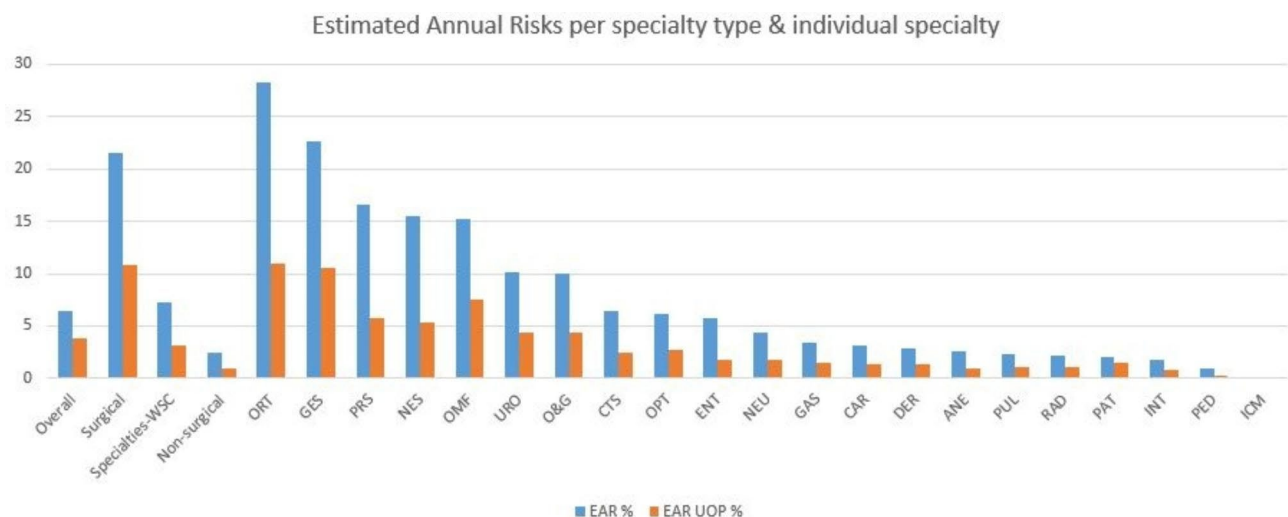


Fig. 2. Estimated annual risk for a claim

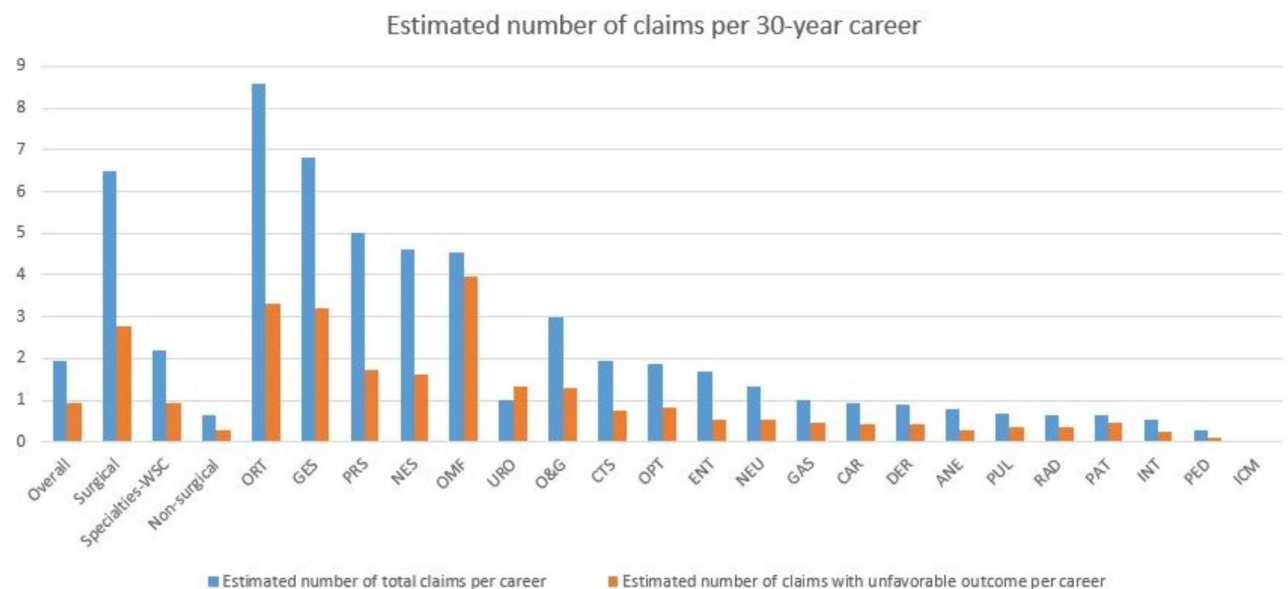


Fig. 3. Number of claims per 30-year career

addition, we found that Orthopedic Surgeons (28%), General Surgeons (23%), and Plastic Surgeons (17%) faced the highest risk for a claim annually.

Compared to non-surgical specialties, the estimated annual risk for surgical specialties was up to tenfold higher. One possible explanation for this is the relatability between surgical intervention and harm. This relatability may be less noticeable in non-surgical care, resulting in fewer claims. For example, patients may more easily relate adverse events like a subsequent infection or bleeding to surgery than to non-surgical interventions. Additional argumentation for this explanation can be found in the difference in estimated risks between specialties considered entirely surgical (e.g., General Surgeons and Neurosurgeons) and specialties with surgical and non-surgical characteristics (e.g., Urologists, ENT-surgeons, and Dermatologists).

Expectation management may be an important and manageable factor in claim volume and estimated risk for claims. Patients' expectations may differ considerably among specialties and settings. For example, patients undergoing elective treatments may impose higher expectations on the outcome. Adverse events during care and not reaching the expected outcome may more easily result in dissatisfaction and ultimately in claims. Contrarily, patients in critical, life-threatening situations may be willing to accept adverse events and unfavorable outcomes as part of their condition and treatment. Expectation management, for example during the informed consent process is, therefore, of vital importance.

The level of control that the individual patient experiences during care may also contribute to the likelihood for filing a claim. Patients undergoing general anesthesia for surgery can experience a 'loss of control' and may therefore assume malpractice in case of perioperative adverse events. Contrary, patients that are to greater extent actively involved in the practical aspects of treatments (e.g., taking medication) may not experience a loss of control which to some extent may explain the difference in estimated risks for surgeons compared to their non-surgical colleagues.

The total financial burden was the highest in specialties that faced most claims. Interestingly, the median burden per claim with an unfavorable outcome for the physician and the median payout per unfavorable claim were the highest in Neurology and Cardiology, followed by their surgical counterparts, Neurosurgery and Cardio-Thoracic Surgery. The severity of the injury and the expected duration of experiencing its damage play a vital role in the expected burden. A possible explanation for the high payout in these specialties may lie in the fact that damage to organ systems such as the central nervous system and the cardiovascular system, can have devastating consequences for patients' quality of life. The material and immaterial harm might be more severe than in other organs. The same explanation may, to some extent, apply to Gynecology & Obstetrics when dealing with harm in newborns, where relatively small errors can result in both devastating and long lived-disabilities. Previous studies have primarily focused on payout to patients^{3,4,6-8}. Studying payout only could potentially result in an underestimation of the actual costs of medical malpractice. We reported the total financial burden (including legal- and documentation costs) and payout. The latter remains the largest contributor to the total burden.

Since almost none of the previous studies adjusted for specialty size and differences in the examined timeframes, an accurate comparison between countries is challenging at this point. However, our findings are in line with previous studies considering the most frequently sued specialties. Studies often found the greatest number of claims filed against Orthopedic surgeons, Gynecologists & Obstetricians, which is in accordance with our findings^{6,8,14}. However, in these studies, neurosurgeons were often among the most sued physicians, which was not the case in our study. Another major difference is the financial burden and payout to patients, which is lower in the Netherlands than in the United States and the United Kingdom^{8,14-16}. In the Netherlands, the payout depends on the severity of the injury and the expected time the injury will last. Often, the so-called 'injury compensation guide' is used to assess the severity of damage in which various types of injuries are classified and expressed in a monetary unit based on current Dutch court decisions¹⁷. This results in a more standardized calculation of damage in which personal circumstances relevant for assessing the damage are considered to some extent but are not of decisive importance. Moreover, the state provides (to some extent) required adjustments due to the injury. For example, lost revenue and adjustments to homes are largely compensated through sources other than the insurer that handles the malpractice claim.

Adverse events can harm patients and relatives, resulting in claims. This harm is devastating, for example, in cases of death or severe disabilities. Patients and relatives are the primary victims in this regard, dealing with the direct consequences. It is important to note that the physician(s) involved may also suffer. They may experience guilt, shame, or anxiety, making them 'second victims'¹⁸. The term 'second victim' has gained interest over the past two decades, with advocates arguing that physicians and their feelings should not be forgotten after adverse events¹⁹. However, opponents to this phenomenon state that incidents and malpractice claims are part of the job, and physicians should hold a 'face it and embrace it' attitude²⁰. Although medical litigation should indeed be considered part of the job, negative feelings that come with complaints and claims can negatively influence the day-to-day practice of physicians^{21,22}. For example, physicians who face claims are more prone to severe psychological distress²³. Claims may also result in defensive behavior. Adequate guidance for individual physicians coping with the negative feelings that come with them, both substantively and interpersonally, is necessary for the well-being of physicians and to decrease the likelihood of practicing defensive medicine. In the present study, we found that especially surgeons face a substantial risk for malpractice claims. Therefore, hospitals should establish facilities that enable adequate legal, psychological and professional support for those physicians who need it.

The present study has limitations. Previous studies determined an increase in the number of filed claims and the financial burden over the past decades with a recent decrease in the number of filed claims⁵. In the present study, we did not report on these trends since we did not consider the claims that were not yet closed. This results in fewer closed claims towards the end of the studied period which may differ for various specialties. Another limitation is the presence of so-called self-regulating academic hospitals. These self-regulating hospitals have chosen to mandate their own legal department to handle claims with an expected burden of up to €K100 without the obligation to report these claims to the insurer. Therefore, we could not include these types of claims in our study. There are only a few self-regulating hospitals, so the overall impact on the total number of reported claims is expected to be low. The present study consists of > 85% of all Dutch hospitals. Only hospitals that were insured throughout the whole period were included. Therefore, the total number of claims in the Netherlands during the investigated period is expected to be higher, probably resulting in an even higher estimated annual risk per specialty. Regardless, the present study holds value since it is the first nationwide study to indicate the difference in risks for malpractice litigation between all major medical specialties, over an extensive period of fifteen years. The estimates should be interpreted as informative for individual physicians.

Assessment of risk factors for particular specialties is best studied through case studies in which the clinical course and motivations for filing a claim can be studied in detail. Furthermore, future research should focus on assessing the emotional impact of claims and complaints on physicians and determine whether indeed in surgical fields, defensive medicine is more broadly practiced than in non-surgical fields based on the higher number of claims.

Conclusion

The present study is the first study to compare the risk for a malpractice claim for all major medical specialties on a nationwide scale. Most malpractice claims in the Netherlands were filed against surgeons. In particular Orthopedic-, General-, and Plastic Surgeons face a higher risk for a claim compared to their colleagues practicing in non-surgical specialties and specialties with surgical characteristics. Given this impact, institutional peer support should be established with a specific focus on surgeons.

Data availability

Data presented in this study were provided by Centramed and MediRisk and are available on request after formal permission from Centramed and MediRisk. A request can be made to senior author J.K.H. Spoor (j.spoor@erasmusmc.nl).

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Author contributions

Wouter Dronkers, conceptualization, data curation, formal analysis, visualization, methodology, project administration, writing original draft, validation, writing- review & editing and agreed to be accountable for all aspects of the work. Gives final approval of the version to be published. Jan van Rees, conceptualization, formal analysis, visualization, methodology, writing – review & editing. Gives final approval of the version to be published. Desiree Klemann, conceptualization, writing – review & editing. Gives final approval of the version to be published. Dennis Buis, supervision, writing – review & editing, legal expertise. Gives final approval of the version to be published. Quirine Amelink, conceptualization, writing – review & editing, legal expertise. Gives final approval of the version to be published. Dirk Grunhagen, conceptualization, methodology, writing – review & editing. Gives final approval of the version to be published. Mostafa Mokhles, writing – review & editing, legal expertise. Gives final approval of the version to be published. W. Peter Vandertop, writing – review & editing, legal expertise. Gives final approval of the version to be published. Marike Broekman, writing – review & editing, legal

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Declarations

Competing interests

Clemens Dirven and Peter Vandertop gave independent medical advice in some of the claims that were included in the present study. Quirine Amelink contributed to the present study in a personal capacity, not in relationship with her current affiliation through the Dutch Health and Youth Care Inspectorate. Wouter Dronkers, Jan van Rees, Désirée Klemann, Dennis Buis, Dirk Grünhagen, Mostafa Mokhles, Marike Broekman, Aart Hendriks, Eric Boersma, Markus Klimek, and Jochem Spoor have no disclosures.

Ethical considerations

The present study was approved by the Institutional Review Board of the Erasmus University Medical Centre, Rotterdam, (METC 2020–0972) and was performed in accordance with the Declaration of Helsinki.

Patients and public involvement

Patients or the public (Centramed and MediRisk) were not involved in the design, or conduct, or reporting, or dissemination plans of our research.

Additional information

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1038/s41598-024-81058-x>.

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