Chapter 27
International Comparative Epicrisis on the Ascertainment and Evaluation of Personal Injury and Damage

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Abstract After a brief historical overview on the role of clinical and forensic medicine in personal injury compensation, the chapter presents a critical comparative epicrisis on the ascertainment and evaluation of personal injury and damage under civil/tort law in Argentina, Australia, Belgium, China, Egypt, Estonia, France, Germany, Hungary, India, Italy, Japan, Kingdom of Saudi Arabia, Lithuania, the Netherlands, Nigeria, Portugal, Spain, Turkey, the UK and the USA. The diverse logical, methodological and criteriological phases of the ascertainment and the medicolegal evaluation of the injury, impairment, disability and any other pecuniary/non-pecuniary loss causally related to the damaging event are critically analysed and discussed. The final part of the chapter summarises the data and evidences discussed in Parts 1 and 6 of the monograph and sheds light on the necessary evolution and investments of bio-medicolegal sciences for keeping in line with postmodernity.

The flowering of modern legal medicine, which can be placed between 1800 and 1850 with the founding of the first university chairs in Strasbourg (1794), Dorpat (1801), Krakow (1804) and Vienna (1805), was characterised by a holistic view of the discipline, substantiated by the systematic methodology and the common aims of ascertainment, or the application of specialised knowledge and expertise to the administration of law in its broadest sense. This period, defined by historians as the "golden age" of legal medicine, saw the birth of university institutes of legal medicine and the development of important satellite disciplines, such as forensic histopathology, toxicology and haematology.

Between 1900 and 1950, there was a further important historical transition, with the introduction of a new issue into the world of legal medicine, the ascertainment and evaluation of personal damage under civil/tort law and the birth of clinical

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forensic medicine which prospered in the countries of Mediterranean Europe and was exported to Latin America and partly to the Far East.

The diverse historical, political and geographical evolution of legal medicine has created different international professional scenarios, especially with regard to the ascertainment of personal injury and damage, which is often entrusted to specialists in insurance medicine, physiatry, orthopaedics, psychiatry or non-medical figures such as insurers, brokers and loss adjusters.

There is no doubt that the assessment of personal injury and damage is an ascertainment of a purely medical nature, implying the need for diagnosis and an evaluative epicrisis of anamnestic, clinical-objective, test, instrumental and laboratory data. Similarly, there is no doubt that these analyses are medicolegal and not clinical in nature, since the purpose is not diagnostic or therapeutic, but that of ascertainment and evaluation. Indeed, the ascertaining physician has to collect substantiated objective data based on scientific evidence, which must be able to overcome the cross-examination between the plaintiff and defendant and take on the character of scientific proof. Following the pervasive Daubert vs. Merrell Dow Pharmaceuticals, Inc. judgement of the Supreme Court of the USA, it is clear that the cross-examination of postmodern justice is represented by the solidity and scientific nature of the methodology utilised for the collection of evidence and the knowledge of the intrinsic error—systematic, erratic, random, conscious or intentional and very rarely malicious—that inevitably accompanies any kind of measurement or ascertainment [1]. In this posing a tremendous challenge to the medicolegal discipline, which must be able to develop new conceptual paradigms and ascertainment methodologies, taking the perspective of the researcher of the third millennium, constantly chasing errors and aware of the fallibility of the ascertainment, of the contestable nature of the assessment and, therefore, of the need for a scientific and technological renewal aimed at rendering the ascertainment methodology of personal injury, impairment, disability and handicap more objective, reproducible, accurate, precise and robust. Unlike the clinician who can rely on the accuracy of the set of symptoms reported by the patient who consults the physician to resolve, or at least improve, their health condition, the medicolegal expert cannot ignore the existence and effects of response bias, a class of behaviours of the examinee that reflect less than fully truthful, accurate or valid symptom report and presentation, whether deliberate or unconscious. Although the incidence of response bias can only be estimated and not objectively measured, there are several reports showing high rates of exaggeration and malingering in the context of impairment and disability assessment [2, 3].

Following the definitions of the World Health Organization (WHO) and the *International Classification of Functioning, Disability and Health* (ICF), the medicolegal expert must objectively ascertain "any loss or abnormality of psychological or anatomical structure or function" (i.e. impairment) and "any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being" (i.e. disability). The conditions for the ascertainment and assessment of the injury, impairment and disability are, therefore, a perfect knowledge of the anatomy and physiology of

the human person and the ability to identify and objectively measure a deviation of the functionality of an organ or apparatus from its normal range. Currently, for many somatic and/or psychic disorders, there exists a lack of biological markers of impairment and disability. The ascertaining physician, while following an evidence-based ascertainment methodology, is often unable to objectify a symptomatology reported by the patient, especially if it pertains to the somatosensory or psychic sphere. The ascertainment of pain, hypogeusia, hyposmia/anosmia, mild neuropsychological impairments and subtle neurological or soft tissue damage, such as those arising from a mild traumatic brain injury or accompanying whiplash injuries, is impossible or inaccurate, imprecise and poorly reproducible [2]. It appears quite evident that the bio-medicolegal sciences need to develop new markers of disease and markers of function/impairment, capable of enhancing diagnostic efficiency in terms of sensitivity and specificity, and to provide objective evidence of the existence of the disorder and its functional implications. In view of the fact that the bio-medicolegal sciences have historically benefited from advances in biomedicine, applying its scientific findings in the forensic field, it is equally clear that many of the current technological platforms of clinical and experimental use could be effectively adopted in clinical forensic and legal medicine for the ascertainment of personal injury and damage. This concerns, in particular, non-invasive or minimally invasive imaging techniques usable in vivo on the examinee, not being dangerous to the health of the same [4–10].

Currently, there is a lack of supranational and/or national guidelines and protocols on personal injury and damage; thus, huge heterogeneity exists not only in the legislative frameworks of compensation but also in the methods and criteria used to verify the existence and extent of the injury/damage.

In the following paragraphs, an international comparative epicrisis on the ascertainment and evaluation of personal injury and damage is given, critically analysing and comparing the overviews on *Europe* (Portugal, Spain, France, Italy, Belgium, the Netherlands, the UK, Germany, Hungary, Lithuania, Estonia), *North and South America* (the USA, Argentina), *Africa* (Egypt, Nigeria) and *Asia and Australia* (Turkey, Kingdom of Saudi Arabia, India, China, Japan, Australia) presented in detail in Parts 2–5, Chaps. 5–25 of the monograph.

27.1 Expert Definition, Qualification and Essential Knowledge

A universal definition of specialist in legal medicine or personal injury and damage evaluator is currently missing, leading to a lack of an international recognition of such an authority.

In all the 21 analysed countries, the expert must possess a medical degree (MD) in order to perform the ascertainment and evaluation of personal injury/damage in both the extrajudicial and judicial settings. In 43 % of the countries considered, a specialisation in legal and/or forensic medicine or a post-lauream

training in insurance medicine is required by law for being classified as an expert in personal injury/damage. Being a specialist in legal and/or forensic medicine or in insurance medicine is mandatory in Belgium, China, Estonia, France, Hungary, India, the Netherlands, Saudi Arabia and Turkey. In the remaining countries, there are no specific compulsory requirements to undergo a medicolegal training in order to carry out personal injury/damage casework.

27.2 Methods of Ascertainment

27.2.1 Collection of Circumstantial, Clinico-documental-Instrumental Data

In all the analysed countries, the first step of the ascertainment is the collection of circumstantial, clinico-documental and instrumental data, with the retrieval of the information believed to be useful for a diagnostic framework, for the reconstruction of the injuring event and the characterisation of injuries, impairments and disabilities.

In the extrajudicial framework, the above data are furnished by the examinee (with his/her consent) or by the lawyer prior and/or during the clinical, medicolegal examination. In the judicial framework, medical and healthcare documentation is presented by the plaintiffs and defendants. In the vast majority of the analysed countries, in the private law framework, the examination is limited to the documents presented by the parties. There are some exceptions, particularly in the African countries. In Egypt, the collection of circumstantial data in cases of traffic or workplace accidents is under the responsibility of the General Administration for Criminal Evidence Investigations—Ministry of the Interior—and the expert can ask for any information deemed necessary. On the other hand, in Nigeria, the medical practitioner ascertains the injury and damage solely on the basis of the data available at the time of the visit (i.e. medical history and clinical visit).

27.2.2 Systematic Clinical and Medicolegal Examination

In 95 % of the analysed countries, each extrajudicial or judicial personal injury/damage case implies a systematic clinical and/or medicolegal ascertainment, including case history and psychophysical examination. The only exception is the Netherlands, where the insurance companies use specialised personnel to make house calls for reducing the number of clinical examinations to be performed by the medical officer and/or the clinical specialist.

There are no national guidelines specifically dealing with the methods to be used for conducting the clinical and/or medicolegal examination. In the majority of the

national frameworks examined, the case history includes family, physiological, remote and recent disease history, along with the collection of any information deemed useful for reconstructing the damaging event and the mechanism of injury. In all the analysed countries, the psychophysical examination includes a full general examination followed by a local assessment of the specific injured area/areas. Due to the absence of specific supranational and/or national guidelines/protocols, the timing, duration, extension and clinical methodology adopted by the ascertaining physician vary considerably within and across different national jurisdictions.

27.2.3 Additional Exams and/or Specialist Consultation

If after the systematic clinical examination further anatomo-functional data are needed, a specialist can be consulted or instrumental exams can be prescribed.

In about 80 % of the analysed countries, the ascertaining physician can directly prescribe non-invasive exams or radiological exams not based on ionising radiations if the patient agrees to undergo that investigation. Invasive or radiological examinations based on ionising radiations are generally prescribed by a specialist after carefully weighing the risk-benefit ratio, in the presence of a clinical reason. In the majority of the analysed countries, indeed, invasive examinations and/or X-rays cannot be performed for medicolegal reasons only, even if the patient gives his/her consent.

27.3 Criteria of Evaluation

In all the analysed countries, the evaluation phase is performed when the injury/disease has reached its maximal medical improvement, which means that healing or stabilisation to a permanent sequela occurred.

27.3.1 Evaluation of the Psychic and Somatic State Prior to the Event/Injury

In 80 % of the analysed countries, the examining physician reconstructs the psychic and physical condition of the examinee prior to the event/injury, using preceding clinical documentation, remote and recent case history and eventual interviews with the family or personal physician. The pre-existing health status of the examinee can affect the reconstruction of the causal link between the damaging event and the injury/impairment and the estimation of the impairment/disability causally related

to the damaging event. If the pre-existing health condition (e.g. egg skull or haemophilia) has caused greater damage than one would expect in a normal person, it is generally not taken into account, and all damages sustained by the examinee are reimbursed. On the other hand, if the event has caused an aggravation of a previous disease in the majority of the analysed countries, only the aggravation is compensated (i.e. differential damage with the pre-existing condition). Only 30 % of the authors, however, have explained in detail the procedure used in their country for calculating the differential damage (i.e. Belgium, France, Italy, Spain, the Netherlands and the USA).

27.3.2 Detailed Reconstruction of the Damaging Event and Mechanism of Injury

In all the analysed countries, the ascertaining physician integrates the available circumstantial data, the recorded medical history and the clinical objective data in order to reconstruct the damaging event and the most probable mechanism of injury. In about 50 % of the countries, the ascertaining physician cooperates with a biomechanical expert or traffic expert for reconstructing the dynamics of the event, comparing the biomechanical data (e.g. velocity, trajectory, energy, etc.) with the clinical and medicolegal data (location, extension, morphology of the injuries).

27.3.3 Identification of Clinico-Pathological Features

In all the analysed countries, the ascertaining physician reconstructs the clinico-pathological features of the injury/disorder in order to reach a clinical diagnosis of the initial, intermediate and final stages and describes the physiopathological pathways, which connect the diverse evolutive phases of the injury/disease. These features and pathways are examined on the basis of scientific sources, such as guidelines, consensus documents, operational procedures, evidence-based publications, treatises and other literature data. In 30 % of the analysed countries, a specific source hierarchy is adopted by the ascertaining physician, who grades the evidence emerging from the literature in the following order: guidelines, consensus documents, procedures, evidence-based literature and finally treatises.

27.3.4 Identification of Personal Injury and Temporary Impairment

In all the analysed countries, the ascertaining physician identifies and analytically describes the injury/injuries related to the damaging event. In Australia, Portugal, the Netherlands and the USA, the expert classifies the injury/disorder using the *International Classification of Functioning, Disability and Health* (ICF).

In 95 % of the analysed countries, the ascertaining physician estimates the duration of the temporary impairment, specifying the length of the initial and intermediate stages of the injury/disorder (e.g. treatment and rehabilitation periods) until stabilisation is reached. The only exception is represented by India where temporary impairment is not compensated. In about 60 % of the analysed countries, temporary impairment is classified in absolute and partial. In Belgium, France, Italy and Spain, three categories of partial impairment are used (75, 50 and 25 % of temporary impairment). In 70 % of the countries, the expert differentiates the general temporary impairment (i.e. duration of the treatment and rehabilitation periods) from the work-related temporary impairment.

27.3.5 Identification of Permanent Impairment

In all the analysed countries, the ascertaining physician identifies and analytically describes the permanent impairment related to the injury, detailing how the physical or psychological pathology of the examinee affects the functioning of his/her organism. As described in detail in Sect. 27.3.7 in several countries, specific national Barèmes and/or evaluation tables exist for the quantification of the degree of impairment expressed as percentage.

27.3.6 Causal Value and Link

In all the analysed countries, the ascertaining physician reconstructs the causal value/link between the event and the injury and between that injury and the temporary/permanent impairment. In the vast majority of the countries considered, the juridical basis of causality is the "conditio sine qua non", and the expert uses the "but-for test" (i.e. counterfactual reasoning) to determine if the condition was necessary to complete the set. Although the standard of proof required in tort/civil cases varies according to the different national juridical systems, it is generally based on the rule of "more probable than not", which means that enough evidence does exist to make the scientific explanation more likely than not that the fact the claimant seeks to prove is true.

27.3.7 Impairment and Disability Description and Estimation

In all the analysed countries, the final step of the clinical and medicolegal assessment is the analytical description of the temporary/permanent impairment, the disability and the pecuniary and/or non-pecuniary losses causally related to the damaging event. The expert describes also the repercussions of the impairment on the work capacity of the examinee, the daily activities and the relational and social life.

27.3.7.1 Barèmes for Impairment Quantification

In 50 % of the analysed countries, specific guidelines or Barèmes or compensation tables exist for quantifying the degree of impairment expressed as percentage of the whole person, with 0 % reflecting a normal function and 100 % a total impairment approaching death.

In *Australia*, *the Netherlands* and *the USA*, the estimation is based on the AMA Guides.

In *Belgium*, the national reference system is the "Official Belgian Scale of Invalidity".

In *China*, permanent impairments are rated according to the "Assessment of the disability grade of injuries from road traffic accident", which consists of five chapters and divides the degree of impairment into ten levels.

In *Egypt*, the percentage of permanent impairment is calculated according to Table n. 2 of the Law 79/1975 on social insurance.

In *France*, permanent impairment rates are estimated using the Barèmes of the Concours Medical or those elaborated by the French Society of Legal Medicine.

In *Italy*, a compensation table by law (Ministerial Decree of the 3 July 2003) has to be used for impairments of less than 10 %, whereas the Barèmes of the Italian Society of Legal Medicine (SIMLA) are utilised for any other kind of impairment including aesthetic prejudice and/or sexual dysfunction.

In *Spain*, permanent impairments caused by traffic accidents are quantified with the "barème of points" or "traffic scale" in force with the Royal Decree 8/2004 (29 October 2004), whereas any other impairment is estimated with the AMA Guides.

In *Portugal*, there are specific Barèmes introduced with the Decreto Lei n. 352/2007 (23 October 2007).

In the *UK*, a national compensation table called "English Barema" is used for the quantification of permanent impairments.

27.3.7.2 Damnum Emergens and Lucrum Cessans

In 65 % of the analysed countries, the clinical or medicolegal expert verifies the appropriateness of the additional expenses incurred as a result of the injury/damage (i.e. medical costs, transportation costs, nursing care expenses, etc.).

Regarding the *lucrum cessans*, in 70 % of the countries, the physician identifies and estimates the temporary work incapacity, and the judge calculates the related loss of earnings. In 85 % of the analysed countries, the physician estimates the permanent work incapacity, describing the general and specific work disability related to the permanent impairment. The economic loss is then quantified by the judge.

27.3.7.3 Other Non-pecuniary Damages

Moral damages (also known as "pain and suffering", or "pretium doloris") are compensated in about 70 % of the analysed countries. Generally, the clinical or medicolegal expert furnishes a description of the physical, psychic and psychological suffering of the examinee during the treatment and rehabilitation phases and after the stabilisation of the injury/disorder. In Belgium, France, Italy, Portugal and the USA, the physician graduates "pain and suffering" using quantitative scales. In Belgium, "a minimum" of 4 points in a 7 degree scale is required for "pain and suffering" be compensated as an extra-damage. In Italy, a 5 degree scale is used, whereas in France and Portugal, a 7 degree scale is adopted.

In 30 % of the analysed countries, "existential damage", defined as loss of amenity, decrease of quality of life or disability to enjoy the pleasure of life, represents a separate category of non-pecuniary damage. In Belgium, the physician describes the repercussion of the impairment and disability on the social and cultural environment of the examinee. In France, Italy and Spain, the medicolegal expert describes the potential effects of the impairment on the quality of life of the damaged individual detailing if the claimed modifications of the lifestyle are compatible with the impairment and disability.

27.4 Conclusions

The assessment of personal injury and damage in the postgenomic era requires a huge investment in human capital, through teaching and education at a university level. The main responsibility of academic institutions, indeed, is to educate towards a critical mentality and a democratic citizenship of the world, safeguarding the transmission of knowledge of the past together with the defence of the idea that it is feasible to innovate such knowledge (Chap. 1).

The role of legal and forensic medicine is to develop a unitary model derived from the characteristics of the datum and the methodology used for acquiring it, along with a "holistic" view of the damaged person, who must be considered a complex ensemble requiring medicolegal representation, and not just a sum of different parts and/or organs (Chap. 2). The medical and medicolegal contribution to compensation for personal damage cannot pursue different directions from that of the scientific approach of general medicine, looking at the deepest component of the person, detailing how the injury, the impairment and the disability influence the existence and quality of life of the damaged individual. The maximum objectivation in the data collection procedure, the highest reproducibility in its utilisation, would ensure the scientific nature of the assessment of personal injury and damage, defining common rules and setting educational standards.

Moreover, it must always be kept in mind that the reconstruction of the causal link between the event and the injury/impairment requires solid and rigorous scientific laws of coverage (Chap. 3), with the final aim of increasing the quality and equity of the system.

The starting point for harmonising personal injury compensation across different juridical systems and improving both vertical justice (among lesser and greater injuries/impairments) and horizontal justice (among similar injuries/impairments) could be the development of a shared clinical and medicolegal methodology for ascertaining and evaluating psychophysical impairments and disabilities (Chap. 4).

The comparative epicrisis conducted on 21 countries (Chaps. 5–25), belonging to five different continents, evidenced that huge heterogeneity still exists not only in the juridical frameworks of personal injury compensation (i.e. liability, burden of proof, causation, categories of compensable pecuniary and non-pecuniary damages) but also in the methods of ascertainment and criteria of evaluation used by the clinical and/or medicolegal expert in order to identify, describe and characterise the injury, the temporary/permanent impairment, the causal value/link between the event and the injury, the work temporary and permanent incapacity, the repercussions of impairments and disabilities on social life and leisure activities and other non-pecuniary losses such as "pain and suffering" and "existential damage" (Chaps. 5–25).

Clinico-medicolegal rigorous and homogenous data, indeed, regardless of the national juridical and judicial framework, offer reproducible parameters to the judge or the jury for evaluating non-pecuniary damages, safeguarding personalization and the equitable power of the judge/jury.

Innovation is absolutely crucial in the field of physical damage and dental damage (Chap. 26) and in the reconstruction of the dynamics of the event by the consultation of a biomechanical expert and the use of finite element modelling (Chap. 28). In the case of suspected simulating or dissimulating behaviours, the ascertaining expert should utilise specific neuropsychological tests in order to detect malingering (Chap. 29), which is of special value when dealing with the psychic-existential damage (Chap. 30), where several disorders and/or impairments are difficult to objectify (e.g. post-traumatic stress disorder, mild brain injuries, etc.).

In light and line with the above, Members of the IALM Working Group on Personal Injury and Damage drafted a methodology to be used for ascertaining psychic-existential damage (Chap. 30). Moreover, during the consensus conference held in Padova in 2014, Members of the IALM Working Group on Personal Injury and Damage comparatively examined the clinical and medicolegal data outlined in the present chapter and elaborated the *Padova Charter* (Chap. 31), the very first international guideline focussing on the methods of ascertainment and criteria of evaluation of personal injury and damage under civil/tort law and a guideline for the ascertainment of whiplash-associated disorders (Chap. 32).

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