Int J Legal Med
DOI 10.1007/s00414-015-1244-9

GUIDELINES

Padova Charter on personal injury and damage under civil-tort law

Medico-legal guidelines on methods of ascertainment and criteria of evaluation

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Received: 1 July 2015 / Accepted: 24 July 2015

Abstract Compensation for personal damage, defined as any pecuniary or non-pecuniary loss causally related to a personal injury under civil-tort law, is strictly based on the local jurisdiction and therefore varies significantly across the world. This manuscript presents the first "International Guidelines on Medico-Legal Methods of Ascertainment and Criteria of Evaluation of Personal Injury and Damage under Civil-Tort Law". This consensus document, which includes a step-by-step illustrated explanation of flow charts articulated in eight sequential steps and a comprehensive description of the ascertainment methodology and the criteria of evaluation, has

Electronic supplementary material The online version of this article (doi:10.1007/s00414-015-1244-9) contains supplementary material, which is available to authorized users.

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Published online: 05 September 2015

been developed by an International Working Group composed of juridical and medico-legal experts and adopted as Guidelines by the International Academy of Legal Medicine (IALM).

Keywords Personal injury · Personal damage · Methods of ascertainment · Pecuniary loss · Non-pecuniary loss · Civil law · IALM · Tort law · Law of delict

Introduction

Personal injury is a legal term for a physical or psychological injury suffered by the plaintiff under tort and/or civil law or statute [1]. Damages related to the injury can be *pecuniary* or *non-pecuniary* in nature [2–4].

Although several comparative studies and research projects on tort-civil law and personal injury claims aimed at developing new tools for promoting harmonisation of civil law have been performed at an international level, heterogeneity and divergences still exist in the definition and compensation of personal injuries/damages across different national legislative systems [3, 4] and in some instances across various provinces/states within the same country such as Canada and USA. It is noteworthy that the compensation in these countries for the same personal injury might be significantly different based on whether the injury was work related and arose out of and in the course of employment versus motor vehicle accident or medical malpractice [5]. Several countries categorise non-pecuniary or non-material damages using defined medical criteria and award damages on the basis of specified barèmes and compensation tables. Other national systems rely on the discretion of the judge (or juries made out of common citizens as in USA), and damages are awarded according to legal practice [4], which in common law countries is based mainly on principle of precedent (i.e. same outcome for same and similar cases of the past).

Although the regulations in various countries are extremely heterogeneous, as indeed are the operational procedures, clinicians and/or medico-legal experts are involved in the majority of cases. Apart from the specific framework (extrajudicial or judicial) in which the professional works, whether the expert acts a consultant for the judge, insurance company, injured party, or other institution or figure, the methods of ascertainment to be followed should be the same, including analysis of clinical and documentary data and execution of clinical and instrumental exams.

The starting point for any awarding procedure, indeed, should be a clinical and medico-legal ascertainment, gaining evidence on the trauma/event causing the injury, the mechanism of injury, the pre-existing health status of the injured party, and the health consequences of the injury (temporary and permanent impairment, work incapacity, mental and behavioural impairment, loss of amenity, etc.) [4, 5].

An international literature survey on this issue retrieved research efforts (i.e. Rothley Group, Trier 2000 Group) and publications aimed at rationalising the clinical/medico-legal assessment of non-pecuniary damages, and proposing different barémes or evaluation scales, consisting of systems of percentage points for each category of physical and/or mental impairment [2–4].

In the United States of America, the gold standard for personal damage assessment is the *The American Medical Association's Guides to the Evaluation of Permanent Impairment (AMA Guides)*, created as a systematic process whereby disability determinations require that an initial physical or psychological impairment rating be made according to the scientific standard and specific medical criteria converting human pathology (illness/injury) to a number expressed as a percentage of the whole person (WPI unit), with a 0 % WPI reflecting a normal functioning and a 100 % approaching death. Since the clinician (medical doctor) is empowered by the knowledge, skills and abilities due to professional training, she/he is thus charged to render such whole person impairment ratings by the American Medical Association using this rating manual (*AMA Guides*) that is a standardised, objective reference for this purpose, originally published in 1971 and periodically updated and revised to the most current AMA Guides, 6th ed., published in 2008 [6]. The AMA Guides are recognised nationally and globally as the preferred reference for medical impairment ratings and has been adopted and used nationally in the USA (both at Federal and States level) as well as internationally in 16 countries for adjudictions of personal injury claims in workers' compensation and civil tort claims including all Canadian provinces and all three Canadian territories, the Netherlands, Australia, New Zealand, Fiji, Hong Kong and Korea, Colombia, Middle East, Malaysia, south Africa, Botswana and Namibia [6]. American Board of Independent Medical Examiners has formally trained and certified by examination thousands of professionals including

medical doctors, lawyers and judges in the use of the AMA Guides across these jurisdictions.

In Europe, in May 2003, a group of medical experts supported by the *Confederation Europeen d'Experts en valutation et reparation du Dommage Corporel* (CEREDOC) presented a "recommendation" to the European Commission, the European Parliament and the Council of Europe proposing European Evaluation Baremés inspired by the French, Belgian, Italian and Spanish compensation tables, which, however, failed to be adopted [4, 7]. Although commendable, the above efforts were probably premature given the absence of a shared clinical and medico-legal ascertainment methodology. Prior to setting any impairment rating criteria, indeed, it is of upmost importance to define the quality requirements for the ascertainment methodology and the evaluation criteria,[1] which are essential to guarantee the objectivity, rigour and reproducibility of the data/evidence collection procedure [7–9]. Currently, other than the AMA Guides as described above, there are no supranational and/or national clinical/medico-legal guidelines dealing specifically with the ascertainment methodology of personal injury and damage under civil-tort law [9, 10]. Therefore, following a scientific initiative by the President of the *International Academy of Legal Medicine* (IALM), an International Working Group composed of medical experts and jurists was created in order to analyse at an intercontinental level the methodological rules, regulations and procedures currently used in the ascertainment and evaluation phases of a personal injury/damage. This comparative, critical and scientific study gave rise to a consensus conference held at the University of Padova where the "*Padova Charter on Methods of Ascertainment and Criteria of Evaluation of Personal Injury/Damage in Tort/Civil Law*" was elaborated. This effort is part of a more extensive project including the Authors and other Experts on personal injury and damage ascertainment, all members of a IALM Working Group, from 21 Countries spread over 5 continents as listed below in alphabetical order: Argentina, Australia, Belgium, China, Egypt, Estonia, France, Germany, Hungary, India, Italy, Japan, Lithuania, Nigeria, Portugal, Spain, The Netherlands, The United Kingdom, Turkey, United Arab Emirates, and United States of America.[2]

Itemisation of the Guidelines

The Guidelines were subdivided into the following *items*.

1. *EXPERT DEFINITION AND ESSENTIAL KNOWLEDGE*
2. *METHODS OF ASCERTAINMENT*
   - *STEP 1. Collection of circumstantial, clinico-documental and instrumental data.*
   - *STEP 2. Systematic clinical examination.*
   - *STEP 3. Clinical synthesis.*

[1] Evaluation criteria are intended as "*logical steps*" to be followed for the assessment of any impairment and/or disability, *not* as "Baréme" or "Compensation Table" or "Guide" for expressing an impairing rating as percentage on the entire psychic and anatomo-functional value of the person.

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- STEP 4. *Instrumental exams and/or specialist consultation.*

3. EVALUATION CRITERIA

- STEP 1. *Verification of maximal medical improvement/ stabilisation.*
- STEP 2. *Clinical and medico-legal epicrisis.*

    a. *Pre-existing health status.*
    b. *Reconstruction of the damaging event.*
    c. *Identification of physiopathological features.*
    d. *Identification of injury, temporary and permanent impairment.*
- STEP 3. *Causal value & link.*
- STEP 4. *Impairment & Disability description.*

1. Expert Definition and Essential Knowledge

Currently, there is a lack of consensus of a universal definition and or qualification of Specialist in Legal Medicine or Personal Injury and Damage Evaluator leading to a lack of an international recognition of such authority. Additionally, these skills are generally not taught during the formal professional training.

In several countries, the ascertainment and evaluation of personal injury and damage is carried out by clinicians, specialists in insurance medicine and/or other professional. In the USA, sub-specialty of *Disability Medicine* is an emerging field described as a clinical medical practice which encompasses the identification, prediction, prevention, assessment, evaluation and management of impairment and disability in both human individuals and populations [5, 6].

This consensus document recommends that the "Expert" (from now on referred to as such) demonstrates the essential knowledge set out below.

a. Notions of tort-civil and administrative laws regarding personal injury and damage, with particular reference to the regulations in the healthcare and insurance sectors
b. Theoretical and practical notions of clinical and medico-legal semeiotics devoted to the assessment of psycho-physical validity in relation to tort/civil and insurance laws
c. Theoretical notions on the subject of material causality, ascertainment methodology and criteria for the identification of the causal value/link between the event and the injury and between this latter and the temporary/ permanent impairment

2. Methods of Ascertainment

Flow chart 1 depicts the four fundamental logical steps to be followed during the ascertainment methodology for any personal injury and/or damage and is described in detail in the following sections.

STEP 1. Collection of Circumstantial, Clinico-Documental-Instrumental Data

The first step is the collection of circumstantial, clinico-documental and instrumental data, with the retrieval of all information believed to be useful for a diagnostic framework, for the reconstruction of the injuring event, the identification of the clinico-pathological features, injuries, impairments and disabilities (*Flow chart* 1).[3]

All documentary data relating to the circumstances and the mechanism of injury (e.g. records drafted by the police and complaint forms relating to the event) should be acquired.

In cases of *traumatic events*, adjunctive documentary data describing the *type* and characteristics of the *involved means*, the *role* of the *injured person*, the presence of correctly used *protection safeguards* (belt, helmet), the *material damages to the involved means* and the report on the *dynamics of the accident* should be collected.

The clinical and instrumental documents of prime importance to be examined are depicted in Fig. 1 and described below (Step 1a and 1b).

STEP 1a. In case of previous Hospital admission

- *Anamnesis and physical examination.*

  As this is essential to evaluate the initial clinical picture and early psycho-physical modification due to the claimed event.

- *Medical Orders Sheet.*

  The decisions made by doctors attending the patient, according to how the case develops, are noted on this sheet.

[3] In several countries, in the private law framework, it is not always possible (even with a judge's authorisation) to integrate the medical and healthcare documentation presented by the plaintiffs and defendants, and the examination is limited to the documents presented by the parties.

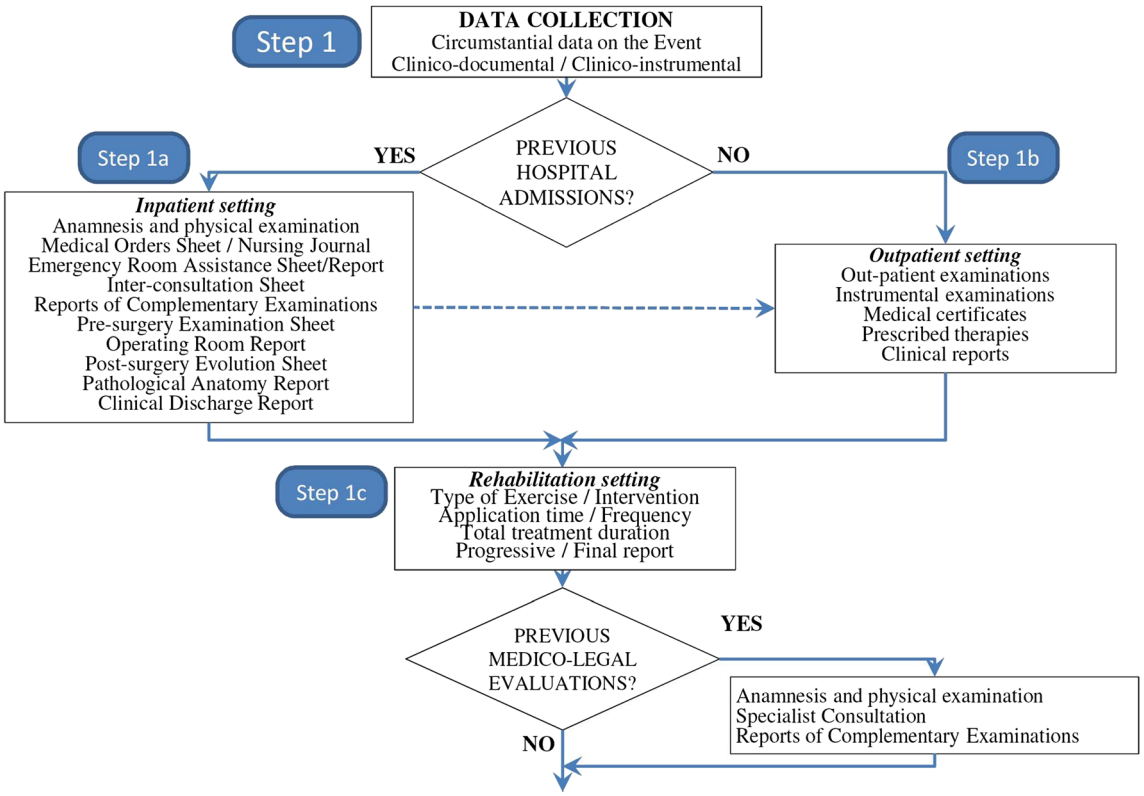

Fig. 1 Flow chart 1. Methods of ascertainment. Steps 1a–c

– *Emergency Room Assistance Sheet or Emergency Room Report.*

This document is compiled when the patient has requested care in the emergency room: it includes the reason for consultations, the results of any examinations and tests requested, clinical opinion and diagnosis. As a result, the following decisions are made: to request inter-consultation or collaboration with a specialist (according to pathology), to start treatment and to send the patient home or to indicate admission to the hospital.

– *Inter-consultation Sheet.*

This sheet records all actions by other specialists who may examine the patient at the request of the doctor responsible for that patient. It is compiled when the patient's state, other than that for which that patient was admitted to hospital, is documented by a specialist from another discipline.

– *Reports of Complementary Examinations.*

These refer to diagnostic tests, the results of which are interpreted and reported by the specialists who made them, e.g. imaging, neurophysiological and psychological tests.

– *Pre-surgery Examination Sheet.*

This document is compiled when surgical intervention is necessary. Pre-surgery examinations are carried out by an anaesthetist, according to established procedures, and patients are classified with respect to their ASA index or risk level.

– *Operating Room Report.*

This report records the nature of the surgical intervention, all incidents related to the technique used and specific patient findings. It is therefore a patient document which is usually illustrated with simple drawings showing what actions were taken in the surgical field, e.g. sutures and drains.

– *Post-surgery Evolution Sheet.*

This sheet describes monitoring of the patient with respect to general conditions and the specific surgical operation performed.

– *Pathological Anatomy Report.*

This report describes any histological or histopathological examination on bioptical or surgical specimens.

– *Nursing Journal.*

This sheet covers all incidents relating to vital signs, administration of medicines and medications, requests for care and any unusual decisions (including, for example, requests to doctors on duty made by nurses for extra medicines and especially analgesics, outside usual working hours). Detailed notes which may be of interest are frequently found in nursing sheets.

– *Clinical Discharge Report.*

This is issued when the patient is discharged from the medical viewpoint and goes home or to another hospital. It summarises the period in which the patient was hospitalised and, although specific, it should be a complete document which includes the cause of hospitalisation, with precise diagnoses, treatments administered, evolution, state of the patient at discharge and treatment(s) to be followed, with indications of any future examinations and whether the family doctor should carry out monitoring.

STEP 1b. In case of Out-Patient care, without hospital admission or after hospital discharge

– *Out-Patient Examination.*

All clinical evaluations where a subject has undergone an outpatient procedure, in order to ascertain the state of health or disease, or the trend of the same, must be taken into consideration in order to reconstruct a picture as complete as possible of the story and its evolution over time.

– *Instrumental Examinations.*

All of the instrumental evaluations that a subject has undergone during an outpatient procedure, in order to ascertain the state of health or disease, or the performance of the same, must be taken into consideration in order to reconstruct a picture as complete as possible of the story and the its evolution over time.

– *Medical Certificates.*

Each certification on the health status for diagnostic, prognostic, therapeutic or work purposes must be taken into consideration in order to render the estimation of the periods of temporary impairment and the evaluation of permanent impairment as precise as possible.

– *Prescribed Therapies.*

All therapeutic prescriptions (i.e. drug treatments, medical devices, etc.) must be checked and evaluated at the end of the periods of temporary impairment for a realistic estimate of the severity of the clinical condition and its evolution over time.

– *Clinical Reports.*

The clinical reports eventually produced in communication between general practitioners and specialist colleagues as well as between physicians and other institutions (private and social insurance, employer, etc.) must be examined in order to create the most accurate clinical picture possible.

STEP 1c. Rehabilitation Documents

In any case, one must also take into account any rehabilitation documents produced during the clinical evolution of the injury and the healing/stabilisation process. These documents will be explanations/summaries of the type of exercise and/or treatment scheduled, execution times and/or application, and their frequency on a daily/weekly/monthly basis, encompassing the total duration of the treatment and the progressive and final reports produced in relation to it.

STEP 2. Systematic Clinical Examination

In case that the subject has already received previous advice/ascertainment, both in extrajudicial and judicial phases, that report must be collected and taken into account. Any previous medical findings, related to the anamnesis, physical examination, as well as any specialist consultations and reports of complementary evaluations must be collected and examined, considering that the above assessments could be consistently spaced in time, being referred also to moments in the distant past. After this documental acquisition, case history collection and psycho-physical examination must be conducted directly (Fig. 2).

STEP 2a. Case History

The first operation is to identify the examined person collecting his/her name, surname, date of birth, marital status, address, telephone, e-mail, information regarding his/her education and any eventual personal insurance cover.

Prior to the medical anamnesis, any information on the damaging event and the mechanism of injury must be collected. The injury/damage is generally

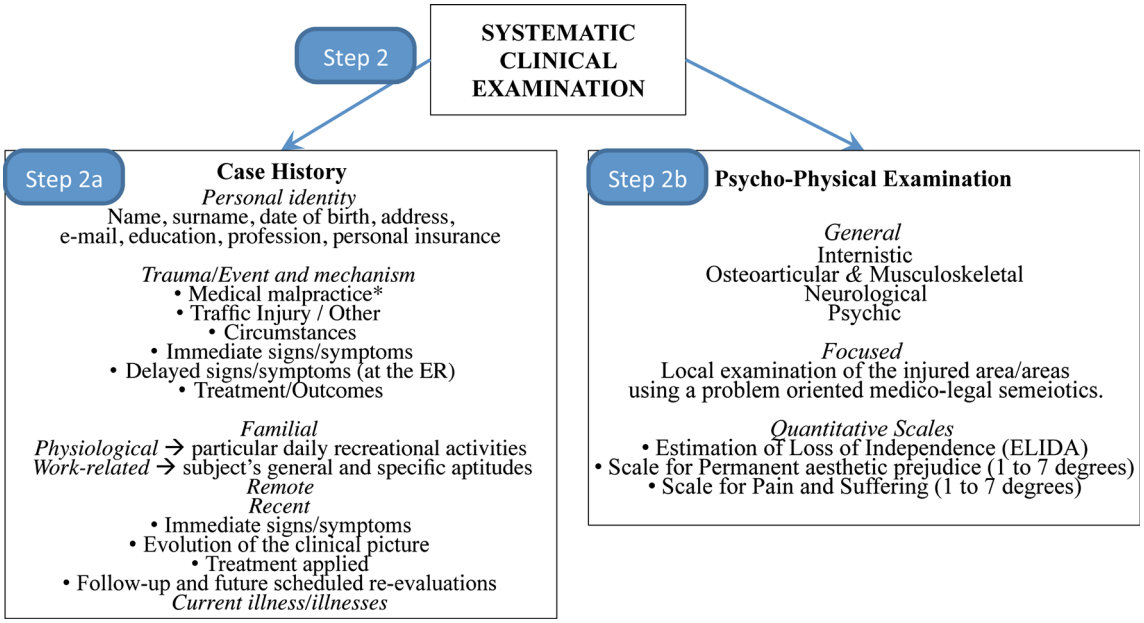

Fig. 2 Flow chart 1. Methods of ascertainment. Steps 2a–b

the consequence of a traffic accident, a medical malpractice case [9] or other types of traumatic events (i.e. sport-related accidents, work-related accidents, domestic accidents, etc.). In order to properly reconstruct the event and the mechanism of injury, all of the available circumstantial and clinical information, including immediate symptoms and signs after the injury, treatments administered and intermediate/final outcomes must be collected.

The anamnesis should include the:

(1) *Family medical history*, recording any health information of the relatives of the examined person (up to the third generation);
(2) *Physiological medical history*, recording information on psychomotor development, life style, sexual habits, allergies, diuresis, defecation and the sleep schedule;
(3) *Remote diseases*, with a comprehensive list of previous sicknesses, operations, traumatic accidents, prostheses and/or ortheses;
(4) *Recent diseases*, with a focus on the immediate signs/symptoms after the event, the evolution of the clinical picture, the treatments applied, the follow-up pathways and any future scheduled re-evaluations. Subsequently, a detailed account of current problems, complaints and symptoms must be collected;
(5) *Work-related and social life aspects*, detailing general/specific working aptitudes, education, previous (listed in chronological order) and current occupation, daily recreational activities, such as hobbies, domestic, sport and leisure activities.

STEP 2b. Psycho-Physical Examination.

The psycho-physical examination should be performed in a consulting room equipped of dressing room, bathroom, medical bed and provided with measurement instruments and provoking tests (e.g. goniometer, inclinometer, ruler, sphygmomanometer, sterile needles and stethoscope).

The psycho-physical examination consists of a comprehensive clinical and medico-legal visit, including internistic, osteoarticular-musculoskeletal, neurological, psychic and local examination of the injured/damaged area/s.

– *Internistic examination*

This examination should include the inspection and palpation of all body systems, the palpation and percussion of the thorax and abdomen and the auscultation of the lungs, heart and bowel sounds with a stethoscope. It aims at identifying any disease or impairment of the internal organs. If any signs of internistic disease emerge during that examination, a specialist consultation with possible first/second level instrumental investigations should be carefully considered.

– *Osteoarticular and Musculoskeletal examination*

This examination, aimed at identifying any impairment of the active and/or passive range of motion of the examinee's joints, should include head, spine, chest, pelvis, upper and lower limbs and any eventual prostheses and ortheses, being performed both by active and passive movements. The active range of motion should be recorded with a goniometer and/or inclinometer.

– *Neurological examination*

This examination, aimed at identifying any impairment of the nervous system, should include the examination of higher functions (gait, speech), mental status (memory and orientation), cranial nerves, non-cortical and cortical sensory systems, motor system (trophic state, muscle tone and strength, involuntary movements), reflexes (primitive, superficial, deep tendon) and sensory and cerebellar functions.

– *Psychic examination*

This examination includes the observation of the general aspect, behaviour, mood and affect, perception, thought and awareness of the examinee. It utilises psychometric tests, neuropsychological tests and assessment scales aimed at identifying and measuring intelligence and personality abnormalities, brain damage and the extent of any psychic, behavioural and socio-relational changes. Laboratory and instrumental exams including biochemical and imaging studies can be performed for identifying/excluding potential causes of mental disorders and/or verifying and monitoring the psychopharmacological treatment. The interpretative *epicrisis* of data involves the comparative evaluation of circumstantial-clinical-behavioural-objective-testistic laboratory and instrumental data, with the aim of formulating a nosographic diagnosis, establishing its severity in relation to the size and intensity of symptoms and the impact on the scholastic, work and relational functions.[4]

– *Local examination*

After the aforementioned systematic general examination, a focus should be made on the injured area/areas performing an *analytical local examination* using a *problem oriented clinical and medico-legal semeiotics*.

Any visible injuries or sequelae will be photographed (overview picture followed by a detailed picture with scale) and analytically described with regard to their localization (using landmarks), mutual distribution and morphometric characteristics. Inspection will be followed by palpation, percussion and auscultation where applicable. The local examination must identify any impairment of the articular, muscular and/or neurological function differentiating true disorders, from malingering and/or simulation [11, 12].

– *Quantitative scales for pain, aesthetic prejudice and loss of independence*

It is recommended to use only widespread scales, which have been previously validated and published on peer-reviewed journals for the objective identification and quantification of suspected impairments, as pain, aesthetic prejudice and loss of independence.

The *Visual Analogue Scale* (VAS) formed of a horizontal line, 10 cm in length, anchored by word descriptors at each end on which the patient marks the point that he/she feels to represent his/her perception is a valid instrument for measuring pain (VAS is not very useful in forensic environment as it is all self report).

The quantification of the aesthetic prejudice should be performed with the *Orofacial Aesthetic Scale* (OAS), developed especially for prosthodontic patients, including eight items investigating the appearance of the examinee: face, profile, mouth, tooth alignment, tooth shape, tooth colour, gums, as well as overall impression measured on an 11-point numeric rating scale (0, "Very dissatisfied"; 10, "Very satisfied" with appearance) [13].

The *Estimation of Loss of Independence Scale* (ELIDA), an adaptive behaviour scale, should be used to measure the need for assistance in daily living activities. Fifty activities, within 10 subscales are rated on a yes/no basis, with higher scores reflecting a higher need of assistance [14].

STEP 3. Clinical synthesis

A synthesis of all the collected data with verification of sufficiency for reconstructing a comprehensive clinical picture must be performed (Fig. 3).

STEP 4. Instrumental exams and/or specialist consultation

In the case that further anatomo-functional data are needed, a specialist can be consulted or instrumental exams can be prescribed.[5]

Instrumental exams of first and second level can be prescribed directly by the expert or by the consulted specialist.

[4] A dedicated International IALM Working Group is drafting an adjunctive methodological flow chart for the ascertainment and evaluation of psychic impairment, pain and suffering, and existential damage.

[5] In some countries, indeed, if the instrumental exams have only medico-legal purposes and not a clear clinical and therapeutic indication, they cannot be performed.

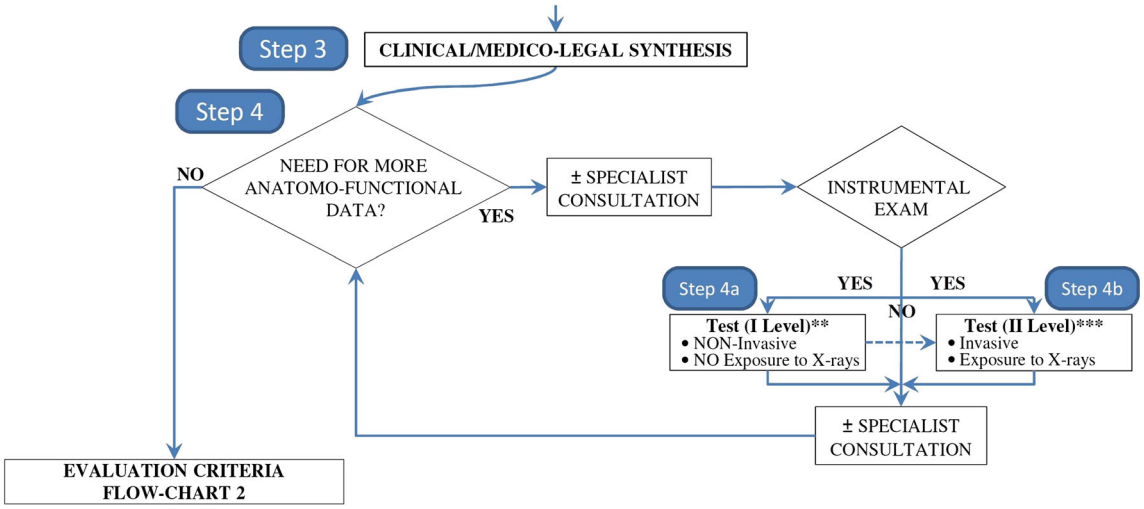

Fig. 3 Flow chart 1. Methods of ascertainment. Steps 3–4

First level exams—step 4a

First level exams are ultrasound, magnetic resonance, electrocardiography, electro-encephalography, and any other investigations which are not harmful for the examinee.

Second level exams—step 4b

Any exams based on the use of ionising radiation or those who could pose a risk for the examinee belong to the second level (e.g. computed tomography, positron emission tomography, electromyography and endoscopy).

The interpretation of the instrumental results can be performed by the expert with sufficient experience and/or expertise in that specific field or by the specialist.

3. Evaluation criteria

Flow chart 2 depicts the four fundamental logical steps to be followed during the evaluation phase for any personal injury and/or damage and is described in detail in the following sections.

STEP 1. Verification of maximal medical improvement/ stabilisation

The evaluation process can start only if the injury/disease has reached its maximal medical improvement, which means that healing or stabilisation to a permanent sequela/e occurred (Fig. 4).

In the event that the clinical situation is still evolving (i.e. on-going disease), it is necessary to postpone the ascertainment until healing or stabilisation occurs.

STEP 2. Clinical and medico-legal epicrisis

This step consists of a comparative analysis of all the collected data aimed at assessing the pre-existing health status (step 2a), reconstructing the damaging event (step 2b), identifying the clinico-pathological diagnosis (step 2c), and the corresponding medico-legal diagnosis (step 2d), in terms of temporary/permanent impairment or other damages (e.g. sexual dysfunction, aesthetic prejudice, decrease of the quality of life).

STEP 2a. Pre-existing health status

It is essential to reconstruct the pre-existing health status in order to detect any changes that occurred as a result of the damaging event. This step will permit the identification of any differential damages attributable to the event itself, according to the principle of personalization of the ascertainment.

STEP 2b. Reconstruction of the damaging event

Basing on the available circumstantial data, the recorded medical history, and the clinical objective data, the dynamics of the damaging event and the mechanism of injury must be reconstructed. For that purpose, if the event is characterised by an impact, a *biomechanical expert* could be consulted, in order to analyse all the available information regarding the scenario before and after the questioned event, and elaborating a finite element model (FEM) taking into account the main aspects of interest (i.e. velocity, trajectory, energy, etc.). A number of experimental data, hypotheses and computations will be necessary to calibrate and validate the model, verifying the required accuracy and precision. The three-dimensional (3D) dynamic simulation reconstructed by the biomechanical expert must then be compared with the injury/disorders ascertained on the victim.

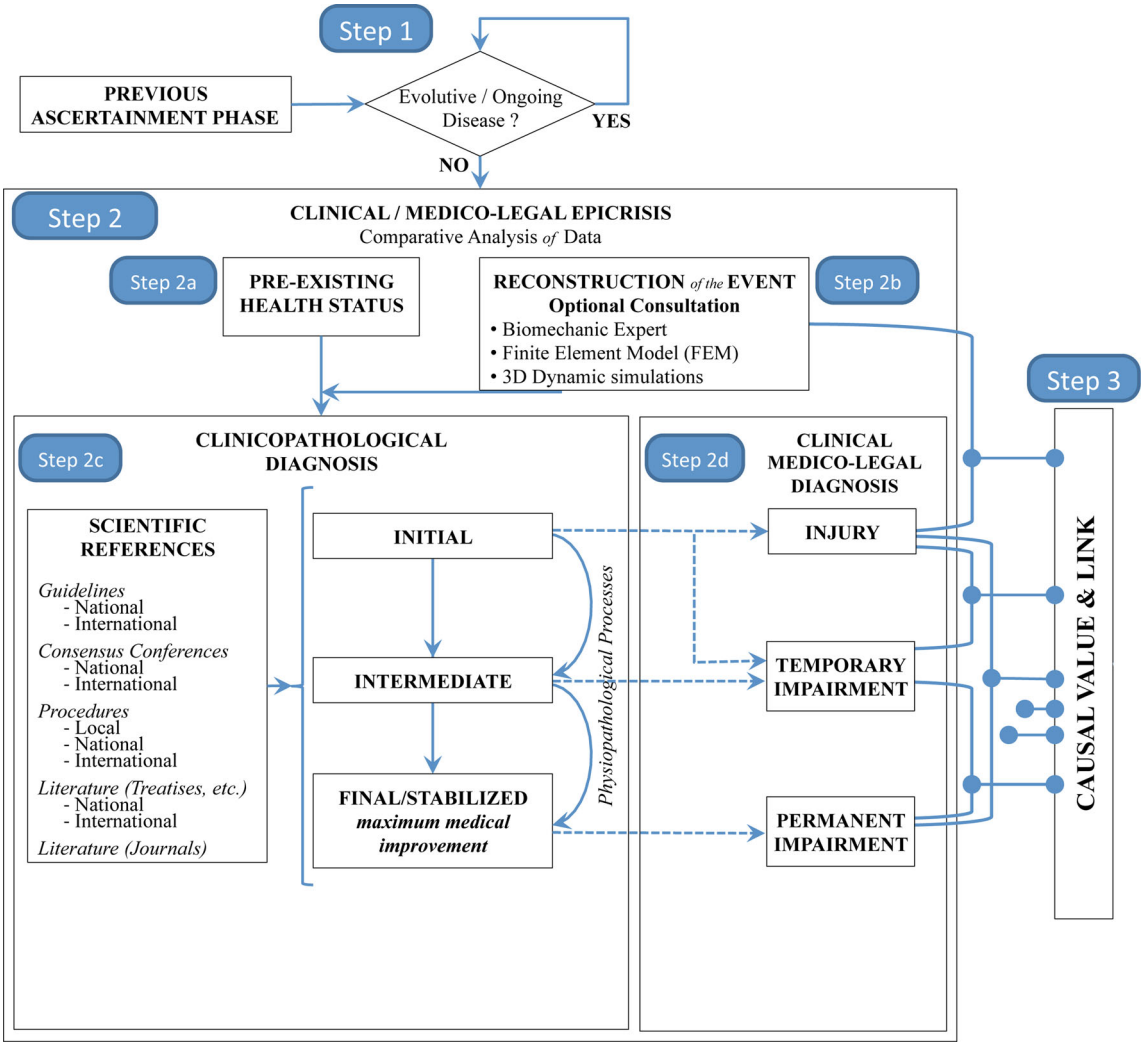

Fig. 4 Flow chart 2. Evaluation criteria. Steps 1–2

STEP 2c. Identification of the clinico-pathological features

The clinico-pathological features of the injury/disorder must be reconstructed in order to reach a clinical diagnosis of the initial, intermediate and final stages.

A thorough analysis and clear description of the physio-pathological pathways, which connect the diverse evolutive phases of the injury/disease, must be performed.

The physio-pathological features and pathways are examined on the basis of scientific sources, such as guidelines, consensus documents, operational procedures, evidence-based publications (Cochrane reviews, meta-analysis, etc.) and other literature, composed of treatises and articles published in peer-reviewed journals (PubMed-MEDLINE, Embase, Scopus, Ovid, ISI Web of Science, etc.), preferably with *Impact Factor*.

These scientific sources of non-equivalent importance must also be graded according to the source hierarchy, shown below.

- Guidelines (international and/or national)
- Consensus documents (international and/or national)
- Procedures (international, national and/or local)
- Literature (treatises, journals)

STEP 2d. Identification of injury, temporary and permanent impairment

After examining the scientific sources and reconstructing the physio-pathological processes linking the identified clinico-pathological features, as described in step 2c, the following have to be determined:

- Injury and temporary impairment related to the initial clinico-pathological features

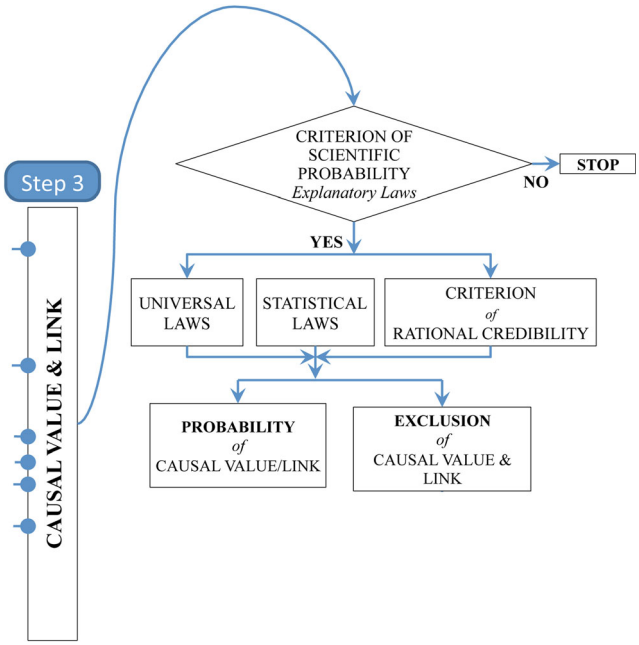

Fig. 5 Flow chart 2. Evaluation criteria. Step 3

- Temporary impairment related to the intermediate clinico-pathological features
- Permanent impairment related to the final/stabilised clinico-pathological features

Moreover, the presence of any other types of impairments with clinical and medico-legal relevance, such as sexual sphere modifications, aesthetic prejudice, alteration of daily activities, relational and social life, must be identified.

STEP 3. Causal value & causal link

The causal value/link between the event and the injury and between that injury and the temporary/permanent impairment must be verified (Fig. 5). This verification must be based on "criteria of scientific probability", such as (a) universal laws, by means of deduction; (b) statistical laws, by means of inference; or, in the absence of such laws, according to (c) the criterion of rational credibility. If this is not possible, due to the absence of "explanatory laws", the ascertainment must be interrupted.

The standard of proof required in tort/civil cases varies according to the national laws, but is generally based on the rule of "more probable, than not" (i.e. enough evidence does exist to make the scientific explanation more likely than not that the fact the claimant seeks to prove is true).

The identification of the degree of probability of the causal link should always be performed and, when possible, expressed as an estimated percentage of probability.

STEP 4. Impairment & disability description

This final step foresees the analytical description of the temporary/permanent impairment, the disability and any other pecuniary or non-pecuniary losses of medico-legal relevance (Fig. 6).

Pecuniary losses Damages are awarded for the injury actually sustained by the victim, and for all the consequential expenses, which flow from the injury. Pecuniary losses may be classified under two different headings:

- The first concern the additional expenses incurred as a result of the damaging event ("*damnum emergens*").
- The second concern the loss of earnings and other benefits which the injured person would have received but for the damaging event ("*lucrum cessans*").

The technical and expert analysis, consisting of an objective analytical description of the temporary and permanent impairments, and their repercussion on the work-capacity, will be utilised by the judge for better estimating the pecuniary losses causally related to the damaging event.

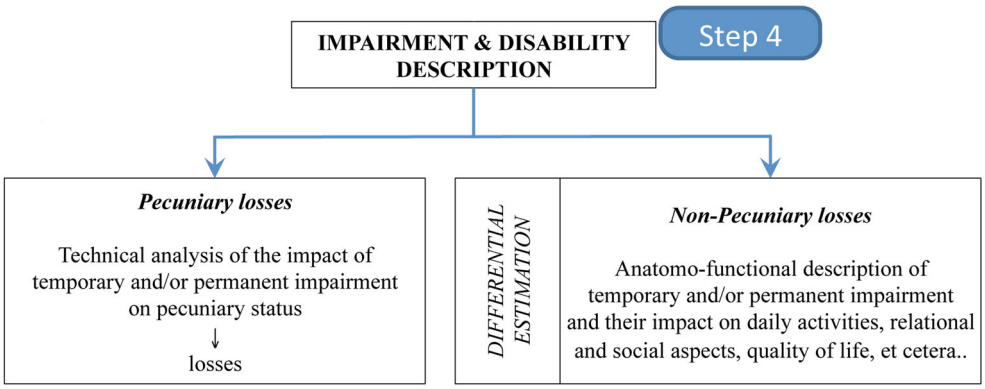

Fig. 6 Flow chart 2. Evaluation criteria. Step 4

Non-pecuniary losses A detailed and motivated description of any aesthetic prejudice, sexual dysfunction and/or temporary/permanent functional impairment, specifying their impact and repercussion on the leisure and social activities, must be furnished.

This analytical and objective description will be utilised by the judge for estimating the non-pecuniary losses causally related to the damaging event.

The present guidelines do not provide harmonised "baremes" or "compensation schemes" for quantifying the impairment/disability and refer to national systems for rating rules and criteria.

Conclusions

"Personal Injury Ascertainment, Evaluation and Compensation" are very complex issues, from clinical, medico-legal and juridical points of view. Huge heterogeneity still exists not only in the legislative frameworks and compensation schemes adopted at different national levels but also in the methodology used to verify the existence and extent of the injury/damage. These procedures must be based on sound scientific methods that guarantee objectivity, reproducibility and rigour in the collection of scientific evidence, worthy as credible evidence at civil court and accepted as scientific proof [15].

However, the current non-homogenous competences, know-how and expertise of the different professionals involved in the process (from insurance professionals, claims adjusters to clinicians and medico-legal experts and lawyers/judges etc.) in the absence of an universal personal injury assessment guideline make the quality and reliability of personal injury/damage assessment and compensation susceptible to great variability across various jurisdictions.

The *Padova Charter* on the "Methods of Ascertainment and Criteria of Evaluation of Personal Injury and Damage under Civil-Tort Law", being the first international consensus document focussing on the very initial phase of the compensation procedure (i.e. the ascertainment of the injury/damage) paves the way for a future harmonisation of the impairment rating and the assessment of any pecuniary and non-pecuniary losses causally related to the personal injury.

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