Faculty of Forensic Psychiatry Annual Conference 5-7 March 2025 Sheraton Hotel, Edinburgh

RC PSYCH ROYAL COLLEGE OF PSYCHIATRISTS

Thursday 6th March 2025

3.15pm-4.30pm	Parallel sessions
1	**Artificial intelligence and novel methodologies in Forensic Psychiatry: Enhancing the detection of validity and Psycho-Existential Damage** Professor Felice Carabellese, Professor Massimo Montisci, Professor Giuseppe Sartori, Dr Mary Davoren, Prof HG Kennedy, Dr Lia Parente

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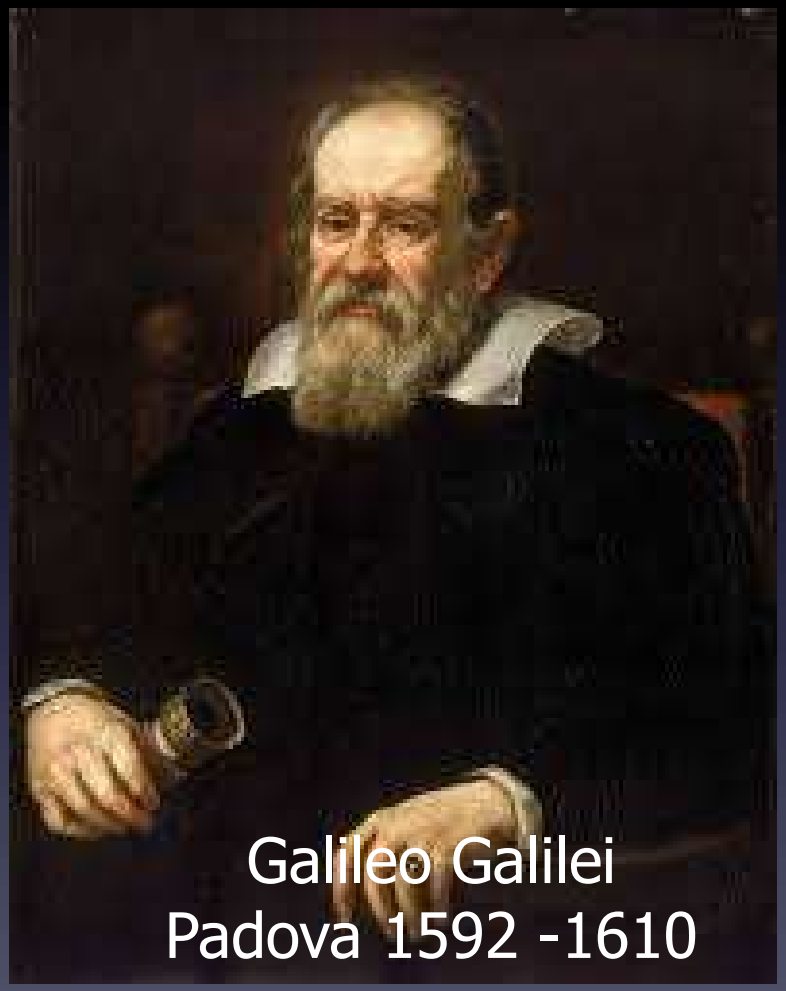
UNIVERSITÀ DEGLI STUDI DI PADOVA



Galileo Galilei
Padova 1592 -1610

1. Introduction
2. Current Challenges in Forensic Psychiatry Assessments
3. Traditional Methodologies & Their Limitations
4. A Novel Methodology for the Objective Assessment of Psychic and Existential Damage
5. The Role of Artificial Intelligence in Forensic Psychiatry
6. Case Studies and Empirical Evidence
7. Conclusions and Future Directions

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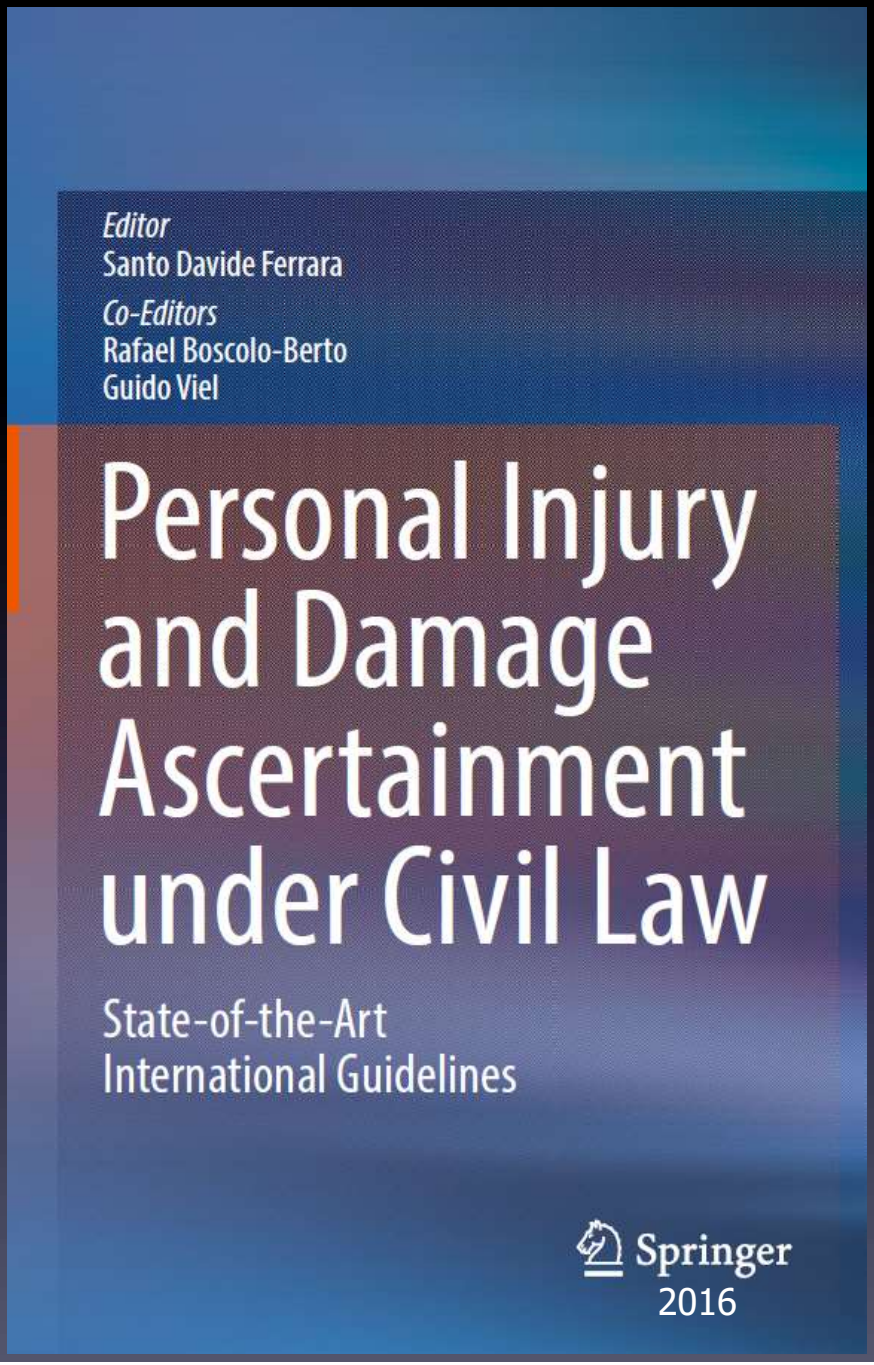
THE GROWING COMPLEXITY OF FORENSIC PSYCHIATRY

1. Forensic Psychiatry sits at the intersection of law and medicine
   - faces significant challenges in objective assessment
   - has an increasing legal and ethical responsibilities → errors can impact criminal responsibility, civil compensation, and custody cases
2. Traditional methods rely heavily on subjective evaluations → high risk of symptom exaggeration for legal/financial gain
3. Difficulties in Retrospective Analysis
4. Growing need for standardization and objectivity in assessments
   - Increasing need for evidence-based, standardized approaches
5. Novel methodologies (and AI) offer new possibilities for accuracy for improved accuracy


Editor
Santo Davide Ferrara
Co-Editors
Rafael Boscolo-Berto
Guido Viel
Personal Injury and Damage Ascertainment under Civil Law
State-of-the-Art International Guidelines
Springer
2016

Chapter 30
A Novel Methodology for the Objective Ascertainment of Psychic and Existential Damage

Santo Davide Ferrara, Viviana Ananian, Eric Baccino, Ranieri Domenici, Claudio Hernàndez-Cueto, George Mendelson, Gian Aristide Norelli, Mohammed Ranavaya, Claudio Terranova, Duarte Nuno Vieira, Guido Viel, Enrique Villanueva, Anna Chiara Zanuzzi, Riccardo Zoia, and Giuseppe Sartori

Abstract The process of ascertaining impairments and/or disabilities which pertain to the "personal sphere" of the individual, such as pain and suffering, loss of amenity, and/or psychological-existential damage, poses particular difficulties in relation to the obtainment of scientific evidence. The "immateriality" and the subjective connotation of the "personal sphere" are, in themselves, critical issues.

Electronic supplementary material: The online version of this chapter (doi:10.1007/978-3-319-29812-2_30) contains supplementary material, which is available to authorized users.

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S.D. Ferrara et al. (eds.), *Personal Injury and Damage Ascertainment under Civil Law*, DOI 10.1007/978-3-319-29812-2_30

Chapter 31
International Guidelines on the Methods of Ascertainment of Personal Injury and Damage Under Civil-Tort Law

Santo Davide Ferrara, Eric Baccino, Rafael Boscolo-Berto, Giovanni Comandè, Ranieri Domenici, Claudio Hernàndez-Cueto, Mete Korkut Gulmen, George Mendelson, Massimo Montisci, Gian Aristide Norelli, Vilma Pinchi, Mohammed Ranavaya, Dina A. Shokry, Vera Sterzik, Yvo Vermylen, Duarte Nuno Vieira, Guido Viel, and Riccardo Zoia

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 been developed by an International Working Group

Electronic supplementary material: The online version of this chapter (doi:10.1007/978-3-319-29812-2_31) contains supplementary material, which is available to authorized users.

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Int J Legal Med (2016) 130:1–12
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

Santo Davide Ferrara[1] · Eric Baccino[2] · Rafael Boscolo-Berto[1] · Giovanni Comandè[3] · Ranieri Domenici[4] · Claudio Hernandez-Cueto[5] · Mete Korkut Gulmen[6] · George Mendelson[7] · Massimo Montisci[1] · Gian Aristide Norelli[8] · Vilma Pinchi[8] · Mohammed Ranavaya[9] · Dina A. Shokry[10] · Vera Sterzik[11] · Yvo Vermylen[12] · Duarte Nuno Vieira[13] · Guido Viel[1] · Riccardo Zoja[14] · Members of the IALM Working Group on Personal Injury and Damage

Int J Legal Med (2016) 130:1387–1399
DOI 10.1007/s00414-016-1366-8

ORIGINAL ARTICLE

A novel methodology for the objective ascertainment of psychic and existential damage

Santo Davide Ferrara[1] · Viviana Ananian[1] · Eric Baccino[2] · Rafael Boscolo–Berto[1] · Ranieri Domenici[3] · Claudio Hernàndez-Cueto[4] · George Mendelson[5] · Gian Aristide Norelli[6] · Mohammed Ranavaya[7] · Claudio Terranova[1] · Duarte Nuno Vieira[8] · Guido Viel[1] · Enrique Villanueva[9] · Riccardo Zoia[10] · Giuseppe Sartori[11]

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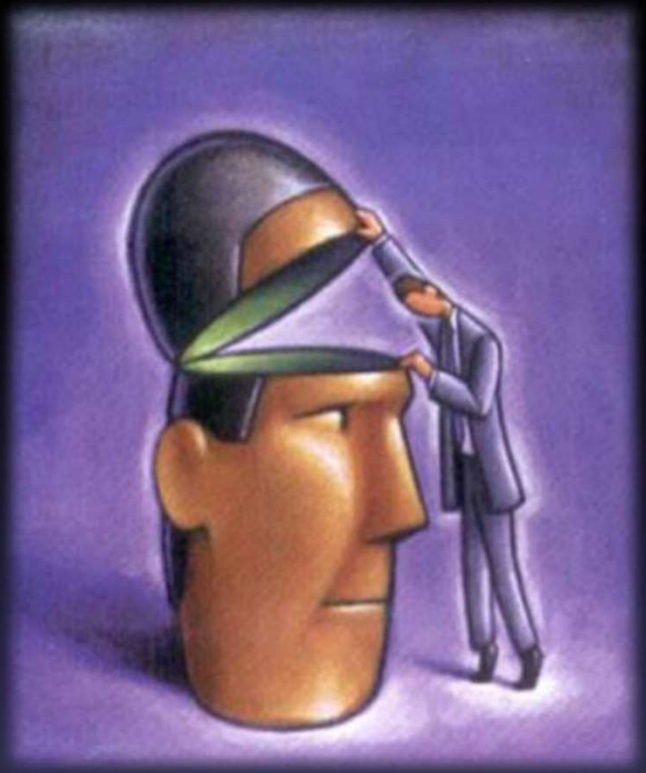
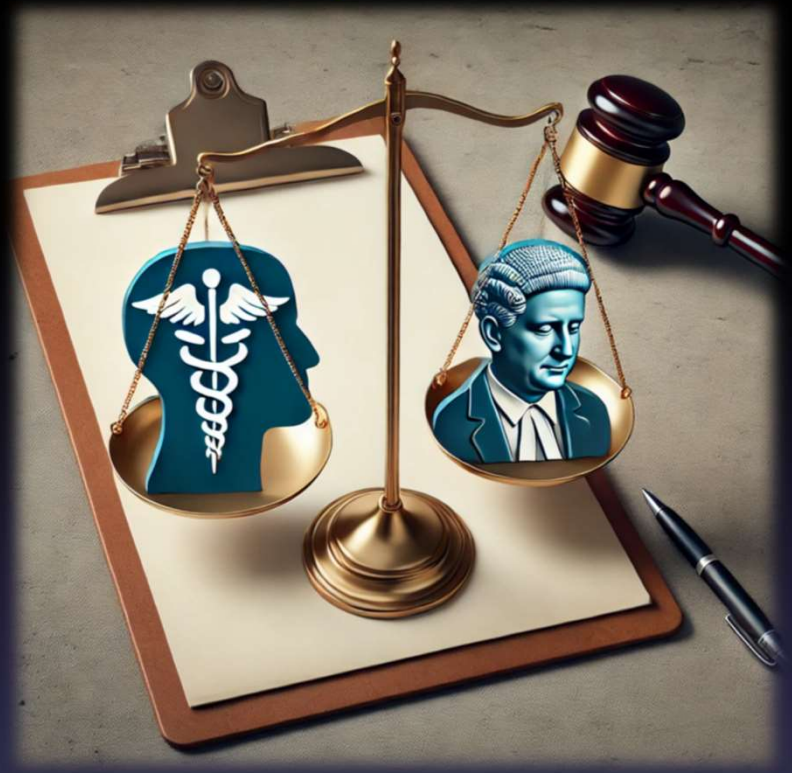
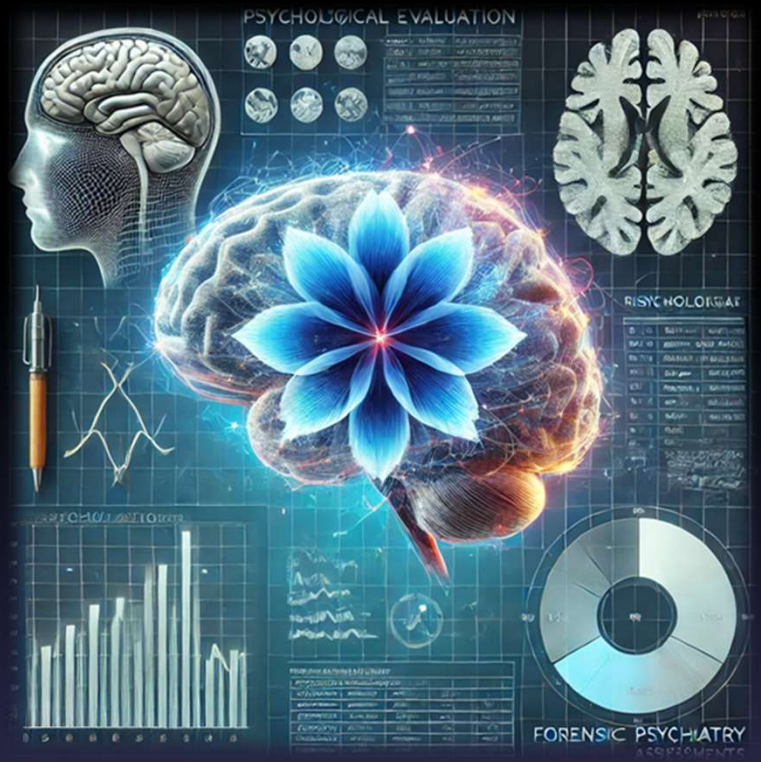
Forensic Psychiatry
Complex Relationship

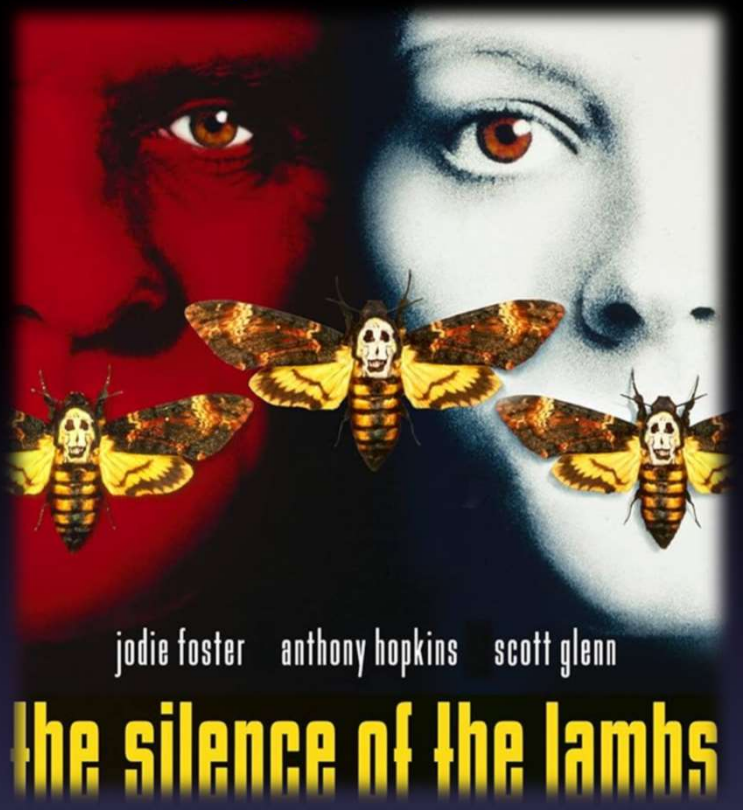




- Subjectivity in evaluating psycho-existential damage
- Heavy reliance on self-reports and clinical interviews
- Difficulties in differentiating genuine mental disorders from malingering
- Lack of universal guidelines for assessing psychic and existential damage

Ethical and Legal Implications





→ Misdiagnoses malingering has severe consequences
  → Ethical/Legal responsibility of forensic psychiatrists
→ Incorrect assessments
  → Legal ramifications: compensation claims, criminal cases
→ Malingering Detection

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Traditional Methodologies

- ✓ Clinical interviews
  - → Advantages & limitations
- ✓ Standard psychometric tests: MMPI-2, SIMS, TOMM
  - → Heavy reliance on self-reports
- ✓ Neurological and psychiatric evaluations
  - → Vulnerability to malingering and bias
- ✓ Variability in expert interpretations
  - → Need for more rigorous, standardized approaches

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Novel Ascertainment Methodology

→ Objective Assessment

→ Multi-step process integrating medical, psychological, and forensic data

→ Objective and evidence-based approach

→ Structured assessment in a complex flow chart outlined in the following sections:

- → 1. Pre-existing psycho-social state
- → 2. Analysis of the injuring event
- → 3. Current psycho-social state
- → 4. Examination of malingering indicators

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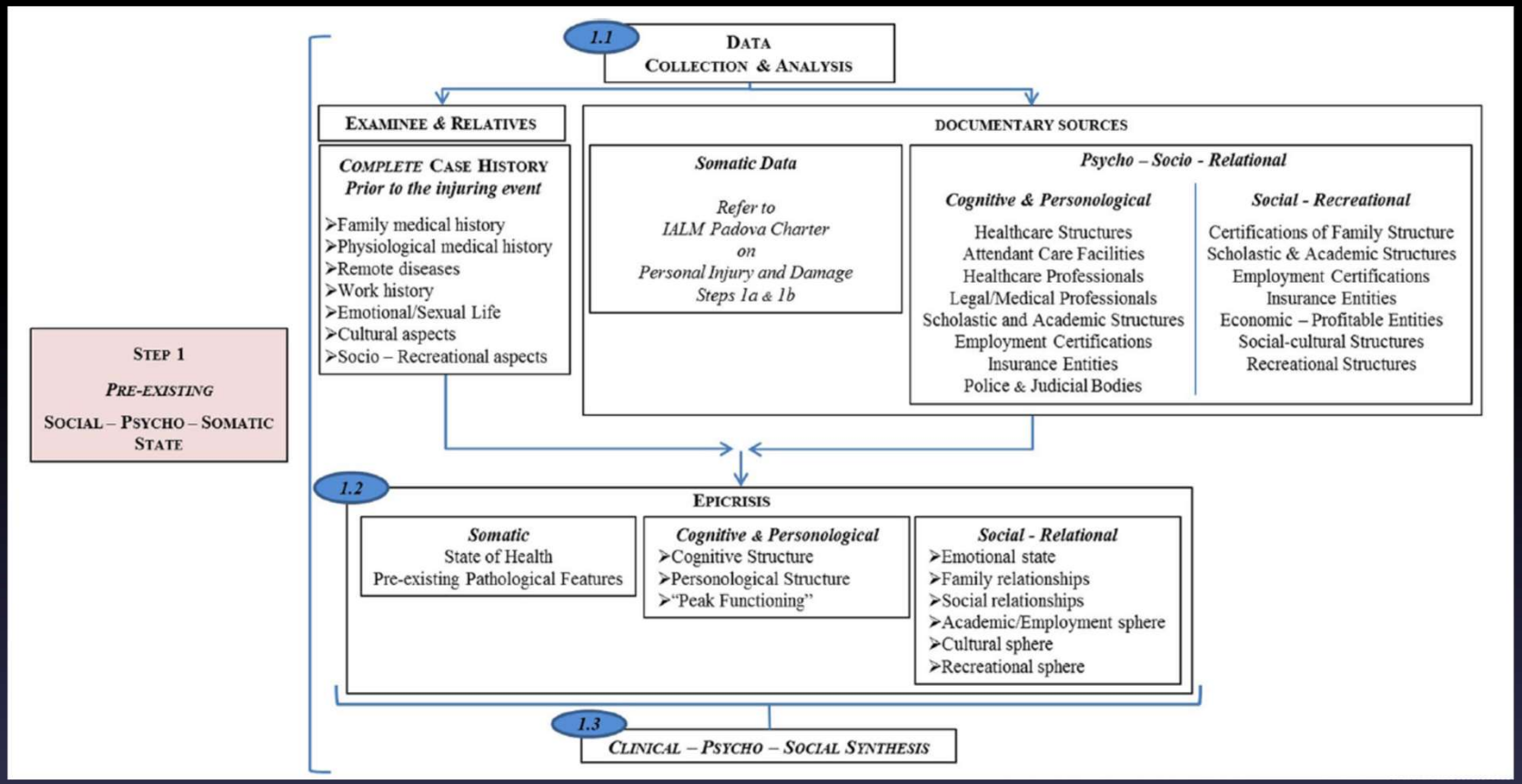
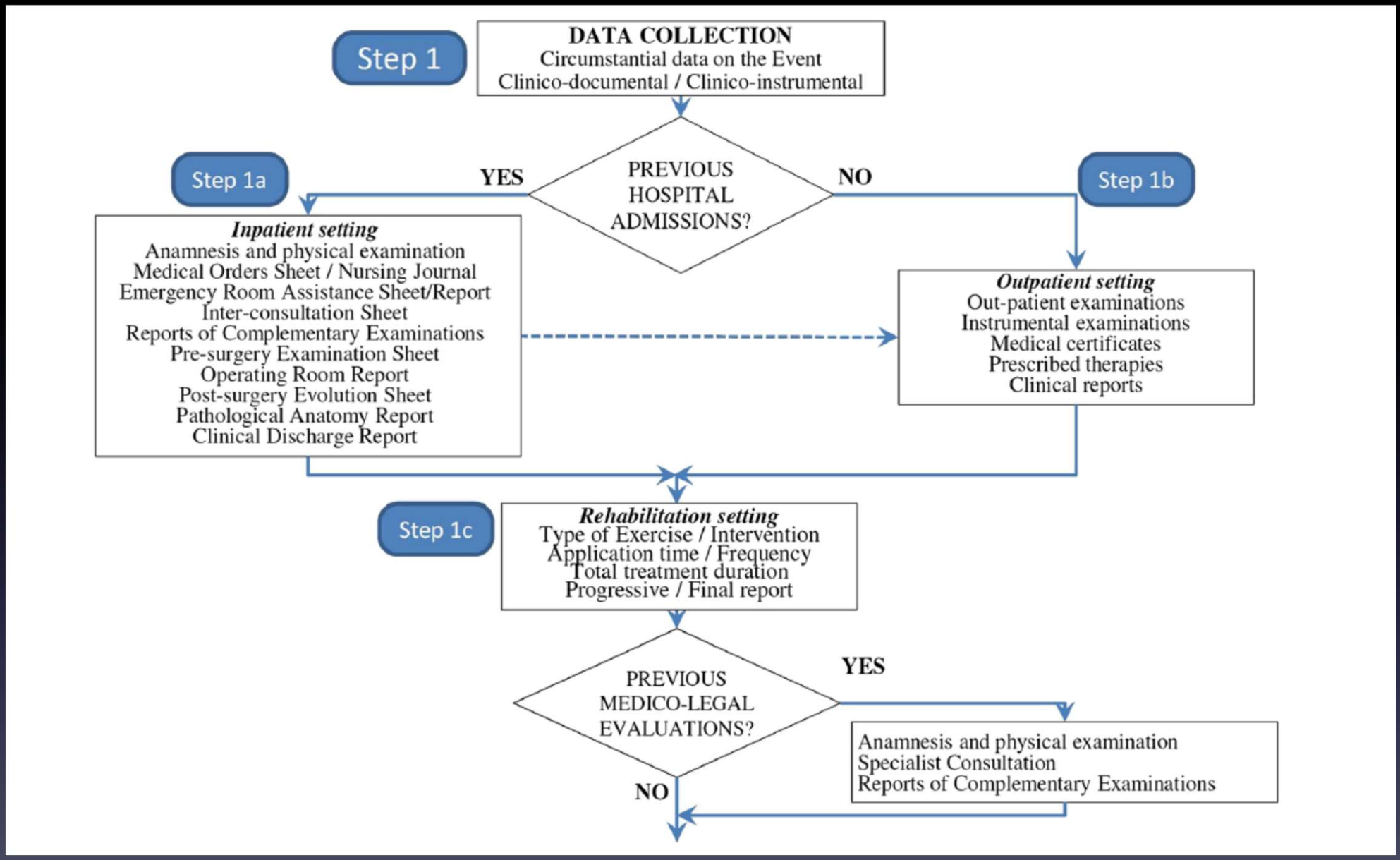
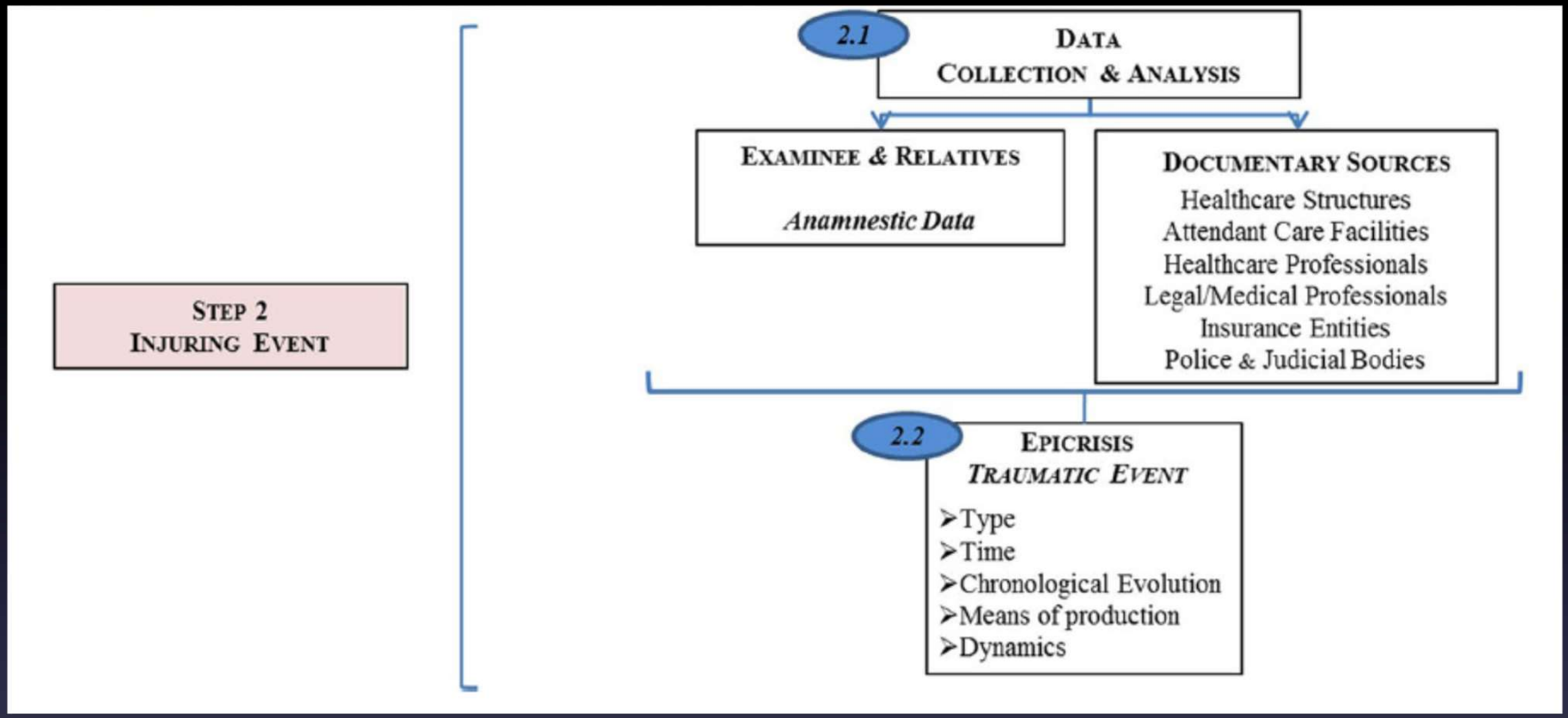
Step 1: Pre-existing Psycho-Social State



- Importance of reconstructing prior mental and physical health
- Collection of circumstantial, medical, and psychological records
- Evaluating baseline functioning before the injuring event
- Objective verification through institutional and medical records

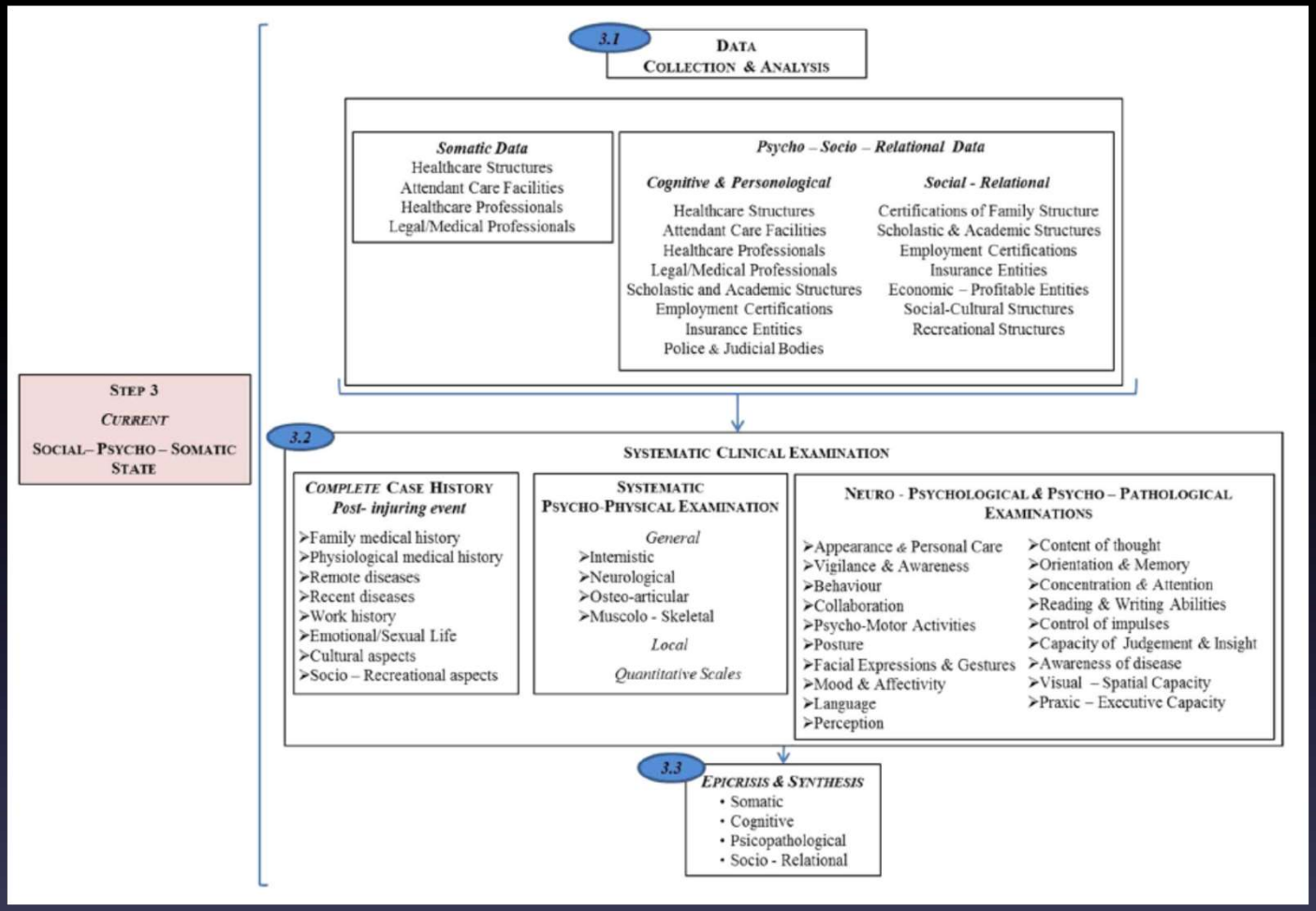

Step 1
DATA COLLECTION
Circumstantial data on the Event
Clinico-documental / Clinico-instrumental
PREVIOUS HOSPITAL ADMISSIONS?
YES
NO
Step 1a
Step 1b
Inpatient setting
Anamnesis and physical examination
Medical Orders Sheet / Nursing Journal
Emergency Room Assistance Sheet/Report
Inter-consultation Sheet
Reports of Complementary Examinations
Pre-surgery Examination Sheet
Operating Room Report
Post-surgery Evolution Sheet
Pathological Anatomy Report
Clinical Discharge Report
Outpatient setting
Out-patient examinations
Instrumental examinations
Medical certificates
Prescribed therapies
Clinical reports
Step 1c
Rehabilitation setting
Type of Exercise / Intervention
Application time / Frequency
Total treatment duration
Progressive / Final report
PREVIOUS MEDICO-LEGAL EVALUATIONS?
YES
NO
Anamnesis and physical examination
Specialist Consultation
Reports of Complementary Examinations

Step 2: Analysis of the Injuring Event



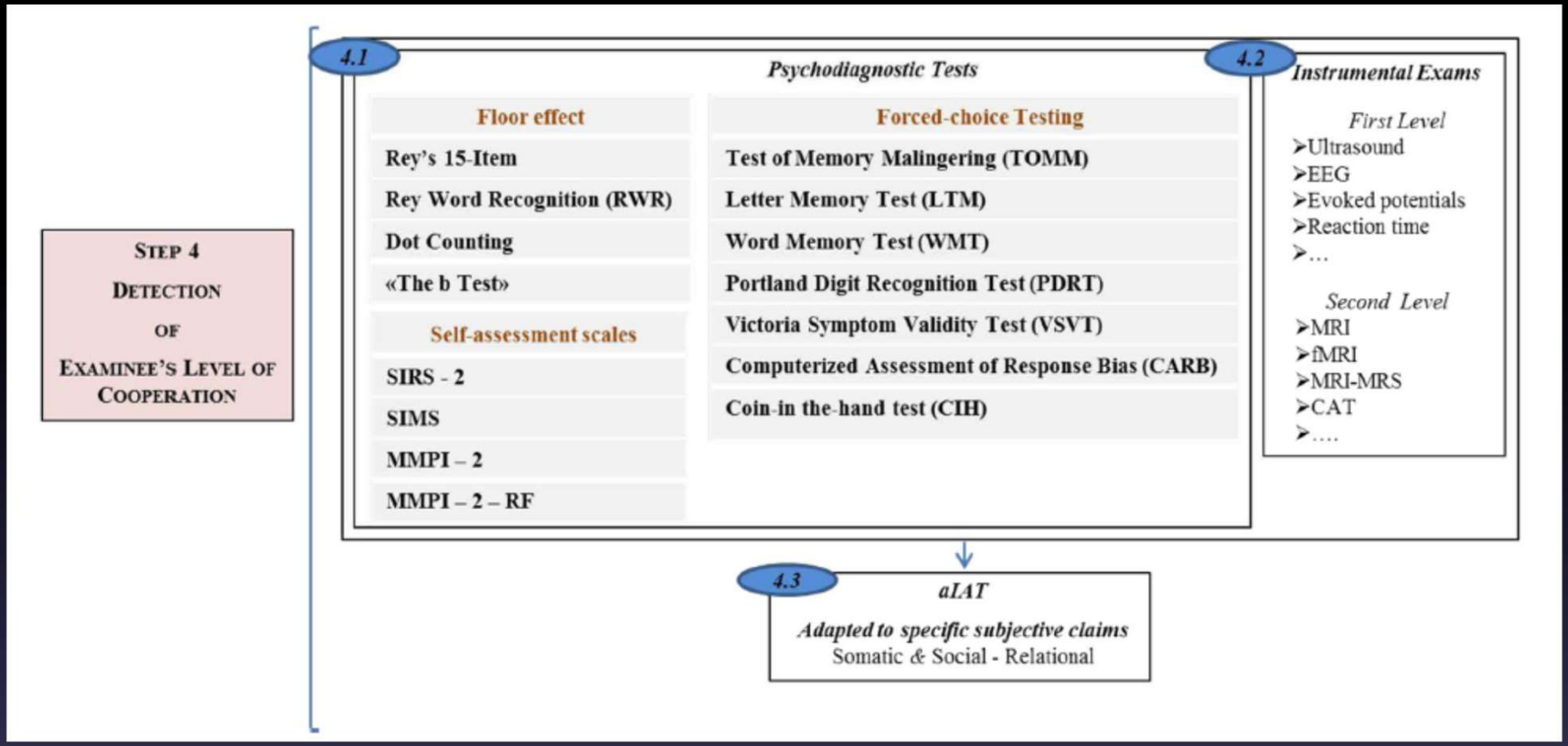
- Understanding the type of trauma: physical vs psychological
- Examining emergency medical records and police reports
- This structured approach helps differentiate legitimate claims from exaggerated or fabricated ones

Step 3: Current Psycho-Social State



- Evaluating psychological and psychiatric sequelae
- Neuropsychological and psychometric testing
- Functional impact on work, relationships, and daily activities
- Integration of multimodal assessments for comprehensive analysis

Step 4: Detection of Malingering

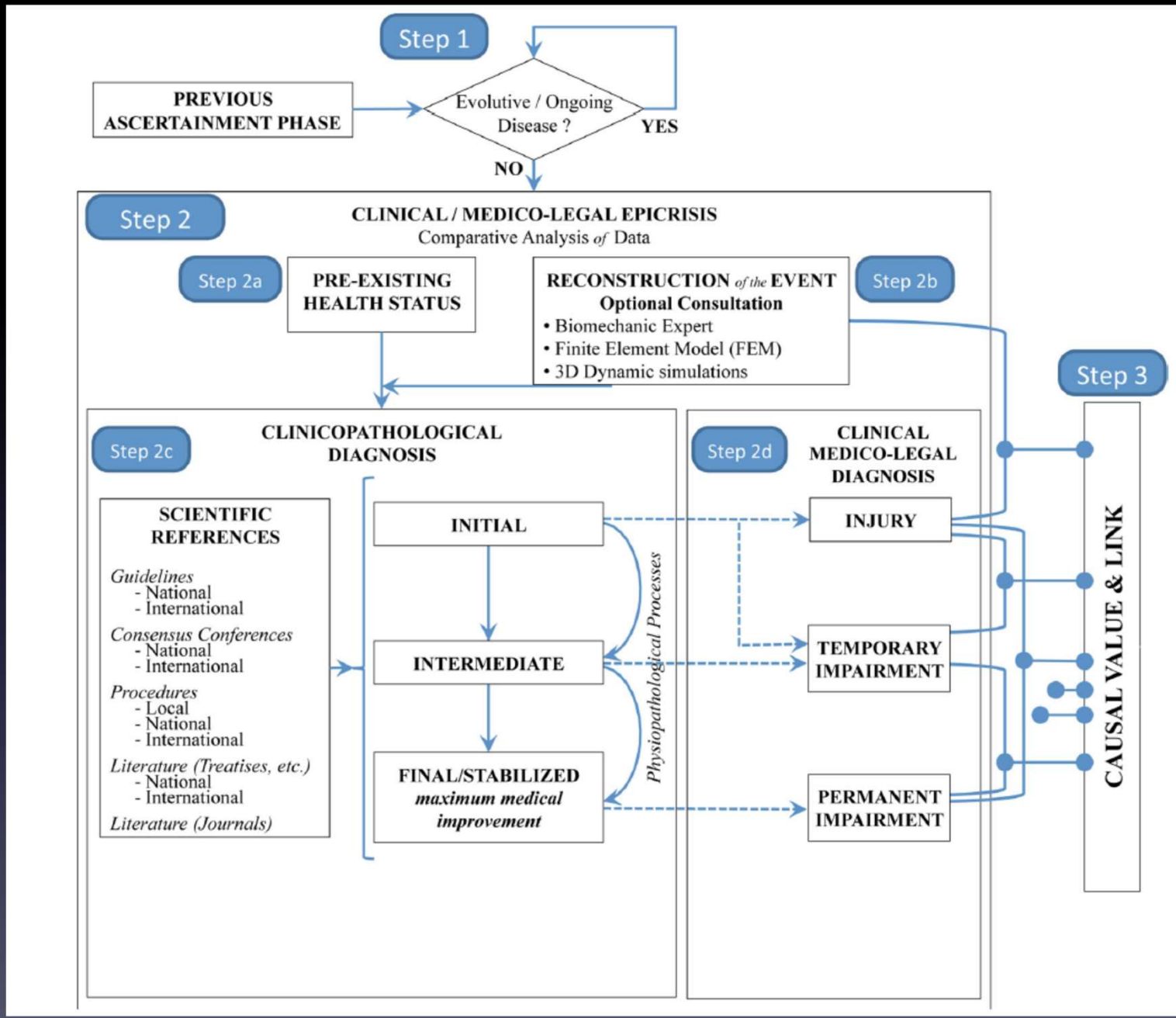


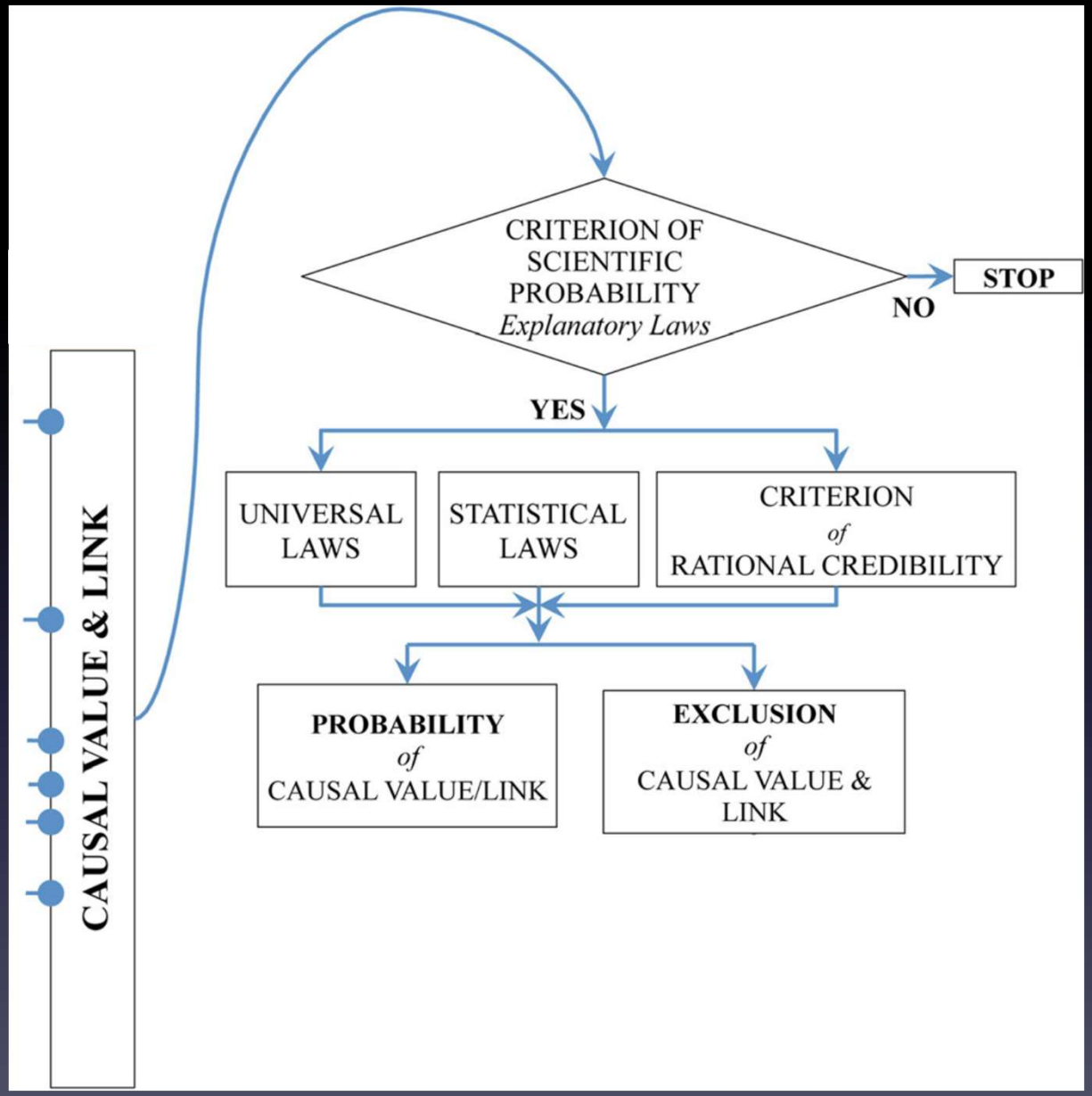
- Identification of inconsistencies in self-reported symptoms
- Use of objective psychometric tests: SIMS, TOMM, VSVT
- Forced-choice paradigms to detect deception
- Advanced methods such as the Autobiographical Implicit Association Test (aIAT)

	Test	Sensibility	Specificity	Malingering cutoffs
Floor effect	Rey 15-item test	70 %	92 %	≤9/15
	Rey word recognition (RWR)	70 %	92 %	≤6/15
	Dot counting test	100 %	>90 %	180 e 130 s
	The b test	68 %	99 %	See interpretation manual
Self-report inventory	Structured interview of reported symptoms-2 (SIRS-2)	67 %	98 %	Specific for each scale
	Structured inventory of malingered symptomatology (SIMS)	52 %	100 %	>14
	Minnesota multiphasic personality inventory-2 (MMPI-2)	>80 %	>90 %	Specific for each scale
	Minnesota multiphasic personality inventory restructured form (MMPI-RF)	92	97	Specific for each scale
Forced choice	Test of memory malingering (TOMM)	91 %	95 %	≤16/50
	Letter memory test (LMT)	73 %	100 %	≤93 %
	Word memory test (WMT)	64 %	100 %	≤75
	Portland digit recognition test (PDRT)	70 %	100 %	≤44
	Victoria symptom validity test (VSVT)	88 %	100 %	≤50 %
	Computerized assessment of responce bias (CARB)	56 %	83 %	≤50 %
	Coin in the hand test (CIH)	93 %	88 %	<850

Autobiographical Implicit Association Test (aIAT)

- Based on the innovative modification of the method proposed by Greenwald et al. [2003] and on the survey of latency of response to pre-defined questions, indirectly establishes the association between concepts, thus allowing to detect autobiographical memories.
- Sartori et al. [2013] proposed a variant of the method described above, referred to as "autobiographical IAT", aimed at ascertaining "punctual" autobiographical memories
- The application of the aIAT method is used to identify, with high probability (91 % accuracy), the veracity of punctual subjective references (somatic and/or socio-relational) that are significant in the evaluation of subjective aspects of dam age (e.g., disabling pain to a specific area of the body, causing significant reduction of the quality of life)


Step 1
PREVIOUS ASCERTAINMENT PHASE
Evolutive / Ongoing Disease ?
YES
NO
Step 2
CLINICAL / MEDICO-LEGAL EPICRISIS
Comparative Analysis of Data
Step 2a
PRE-EXISTING HEALTH STATUS
RECONSTRUCTION of the EVENT
Optional Consultation
• Biomechanic Expert
• Finite Element Model (FEM)
• 3D Dynamic simulations
Step 2b
Step 3
Step 2c
CLINICOPATHOLOGICAL DIAGNOSIS
SCIENTIFIC REFERENCES
Guidelines
- National
- International
Consensus Conferences
- National
- International
Procedures
- Local
- National
- International
Literature (Treatises, etc.)
- National
- International
Literature (Journals)
INITIAL
INTERMEDIATE
FINAL/STABILIZED
maximum medical improvement
Physiopathological Processes
Step 2d
CLINICAL MEDICO-LEGAL DIAGNOSIS
INJURY
TEMPORARY IMPAIRMENT
PERMANENT IMPAIRMENT
CAUSAL VALUE & LINK


CRITERION OF
SCIENTIFIC
PROBABILITY
Explanatory Laws
NO
STOP
YES
UNIVERSAL
LAWS
STATISTICAL
LAWS
CRITERION
of
RATIONAL CREDIBILITY
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Role of AI in Forensic Psychiatry

→ AI-assisted linguistic analysis of self-reports

Natural Language Processing (NLP) for evaluating self-reports

→ Machine Learning models trained to detect malingering patterns

Machine Learning models for pattern recognition

→ AI-driven facial and behavioral analysis

→ The potential for automated, bias-free forensic evaluations

→ AI-powered analysis of malingering indicators

Potential for standardized, reproducible forensic assessments.

frontiers | Frontiers in Psychiatry

TYPE Conceptual Analysis
PUBLISHED 08 March 2024
DOI 10.3389/fpsyt.2024.1346059

Beyond Discrimination: Generative AI Applications and Ethical Challenges in Forensic Psychiatry

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1. AI Paradigms

- *Discriminative* AI: Classifies data, used for risk assessment and diagnostic support
- *Generative* AI: Creates new data, offering potential in education, simulations, and patient profiling

2. Types of Generative AI Models

- GANs: Create realistic images, videos (e.g., deepfakes)
- Transformers: Power Large Language Models (LLMs) like ChatGPT
- Diffusion Models: Used in advanced image generation (e.g., DALL-E)
- VAEs & NeRFs: Aid in data reconstruction and 3D rendering

3. AI in Forensic Psychiatry

- *Discriminative AI* Applications:
  - Risk assessment for recidivism, violence prediction
  - Diagnostic support & personalized treatment planning
- *Generative AI* Advancements:
  - Synthesized patient data for research & education
  - AI-powered simulations for training forensic professionals

4. Ethical & Legal Challenges

- Bias & Discrimination: AI may reinforce racial, gender, and psychiatric stigma
- Transparency & Accountability: AI-generated decisions lack clear interpretability
- Data Privacy & Security: Handling sensitive patient data poses ethical risks
- Overreliance on AI: Courts and psychiatrists risk misusing AI-generated insights
- Misinformation & Deepfakes: AI-generated evidence may complicate legal processes
- Environmental & Social Impact: AI resource consumption and power imbalances in tech adoption

5. Conclusion

- Regulation & Ethical Oversight: AI must ***be carefully*** integrated into forensic settings
- Interdisciplinary Collaboration: Psychiatrists, AI developers, and legal experts must cooperate
- Balancing Innovation & Ethics: Generative AI ***has potential but requires strict governance***

International Journal of Law and Psychiatry 101 (2025) 102086

Contents lists available at ScienceDirect

International Journal of Law and Psychiatry

journal homepage: www.elsevier.com/locate/ijlawpsy

Large language models and psychiatry

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ARTICLE INFO

Keywords:
Large language models
Psychiatry
Reasoning
Intelligence

ABSTRACT

Integrating Generative Artificial Intelligence and Large Language Models (LLMs) such as GPT-4 is transforming clinical medicine and cognitive psychology. These models exhibit remarkable capabilities in understanding and generating human-like language, which can enhance various aspects of healthcare, including clinical decision-making and psychological counseling.

LLMs, trained on vast datasets, function by predicting the next word in a sequence, endowing them with extensive knowledge and reasoning abilities. Their adaptability allows them to perform a wide range of language-related tasks, significantly contributing to advancements in cognitive psychology and psychiatry. These models demonstrate proficiency in tasks such as analogical reasoning, metaphor comprehension, and problem-solving, often achieving performance comparable to neurotypical humans. Despite their impressive capabilities, LLMs still exhibit limitations in causal reasoning and complex planning. However, their continuous improvement, exemplified by the enhanced performance of GPT-4 over its predecessors, suggests a trajectory towards overcoming these challenges. The ongoing debate about the "intelligence" of LLMs revolves around their ability to mimic human-like reasoning and understanding, a focal point of contemporary research.

This paper explores the cognitive abilities of LLMs, comparing them with human cognitive processes and examining their performance on various psychological tests. It highlights the emergent properties of LLMs, their potential to transform cognitive psychology, and the different applications of LLMs in psychiatry, highlighting the limitations, the ethical considerations, and the importance of scaling and fine-tuning these models to enhance their capabilities. We also explore the parallels between LLMs and human error patterns, underscoring the significance of using LLMs as models for human cognition.

Overall, this paper provides substantial evidence supporting the role of LLMs in reviving associationism as a viable framework for understanding human cognition while acknowledging the current limitations and the need for further research to fully realize their potential.

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CASE STUDIES

Case 1. Criminal law context

This case regards the ascertainment of psychic impairments engendered in a male subject of 24 years, who had been pushed down the stairs by a friend during an argument, resulting in a blunt trauma to the head. The results of the clinical and radiographic ascertainments performed in the emergency room and in the follow-up were negative for injuries to the cranial bones and the encephalon. The neuropsychological examination had shown the presence of a pure retrograde amnesia to be the only pathology present.

The public prosecutor therefore requested that further analysis be carried out, for the purpose of *proving* the existence of psychic damage subsequent to the event.

The application of the proposed methodology provided the following results.

Step 1. demonstrated the complete psychic-physical well-being prior to the injuring event.

Step 2. demonstrated that the type and extent of the trauma were not likely to lead to the occurrence of retrograde amnesia, as described by the examinee.

Step 3. highlighted discrepant data. In particular, the latency of response to pre-defined questions detected during the autobiographical Implicit Association Test was decisive in confirming the lack of cooperation on behalf of the examinee.

In conclusion, the absence of permanent impairments as a result of the event was demonstrated.

Case 2. Civil law context

This case regarded the ascertainment of impairments engendered in a male subject of 55 years, following a motorcycle traffic accident that occurred in October 2012, resulting in the need for amputation of the right leg. On the stabilization of the permanent impairments (over 1 year), the subject reported the persistent perception of the amputated limb, including chronic pain (so-called "phantom limb syndrome"), with related psycho-existential damage deriving from chronic insomnia, reactive depression, inability to maintain a sitting position for a prolonged period of time, and severe limitation of sexual activity, greatly affecting his quality of life.

The insurance company refused to compensate for these specific impairments, declaring them "not objectifiable."

The proposed methodology was therefore applied, with the following aims:

- ascertain the absence of somatic and/or psychiatric pathologies (e.g., depression and insomnia) in the period prior to the injuring event;
- ascertain the quality of life prior to the injuring event (e.g., work, affective-sexual, cultural and socio-recreational contexts); and
- ascertain the actual existence of perception and chronic pain in the amputated limb.

The systematic application of the various methods provided the following results.

1. demonstrated documentarily the complete psycho-physical well-being prior to the injuring event, as well as an intense level of socio-recreational activity, making it possible to rule out with certainty the existence of depression prior to the injuring event.
2. permitted the accurate description of the dynamic of the injuring event.

Regarding *step 3*, the complete semeiotic examination excluded the presence of somatic diseases; psychopathological and neuropsychological tests excluded the presence of cognitive deficits or psychopathologies; blood tests excluded infectious or rheumatologic diseases; the lower limb electromyography excluded peripheral neuropathies, nerve entrapments, or injury of the nerve bundles; the functional-MRI revealed signal alterations in the cortical areas involved in the processing of somatosensory and pain information.

The final application of the autobiographical implicit association test confirmed the veracity of the references relating to the presence of a sensation of pain and burning in the amputated limb.

nclusion, the uniformity of the results obtained from cation of the different methods permitted a high pro-lue in relation to the actual presence of phantom limb e.

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CONCLUSIONS
Final Thoughts

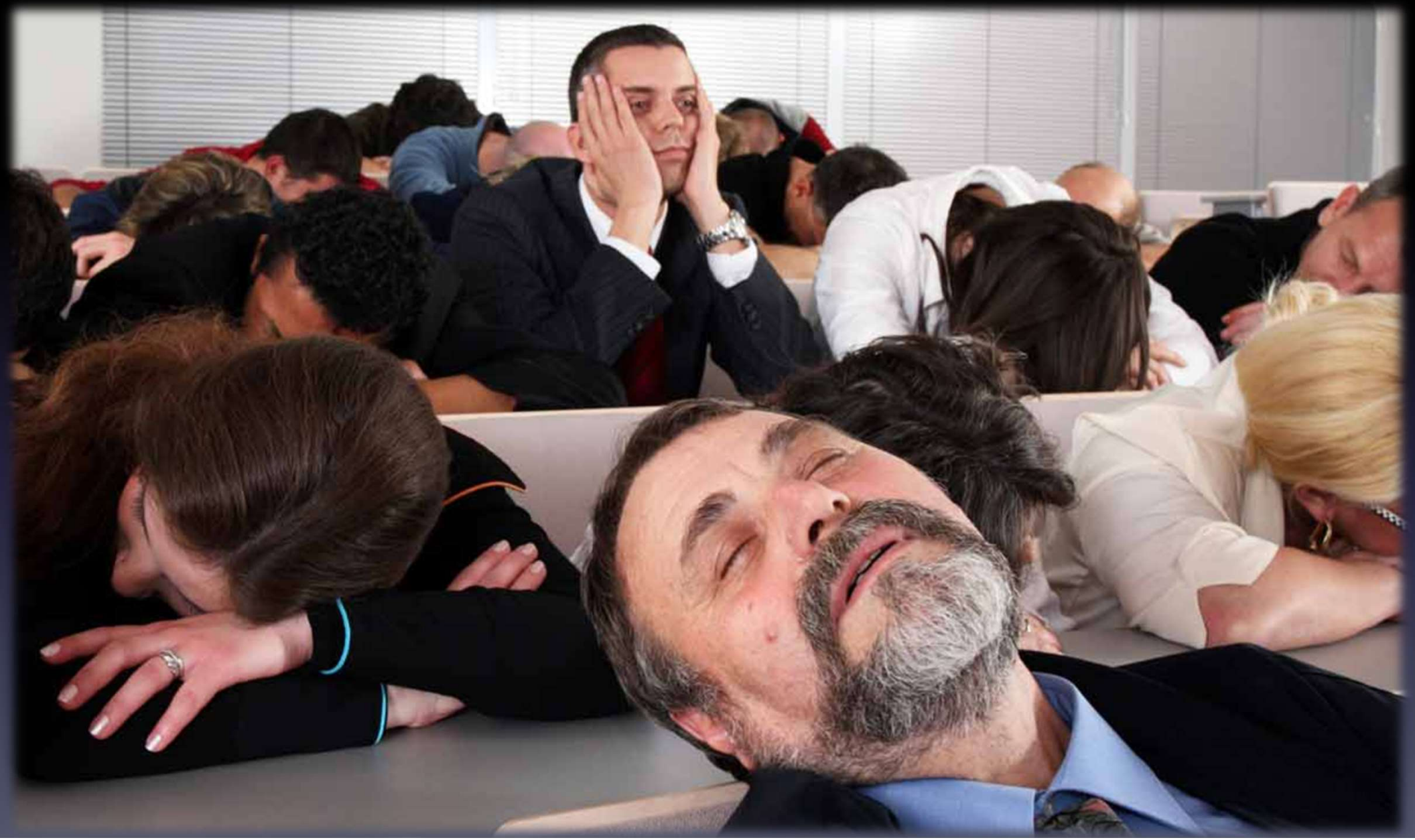
1. Forensic psychiatry requires more objective and reliable assessment tools
2. Novel methodologies provide a structured and validated approach

   Objective, standardized assessments reduce bias and errors
3. AI will play a crucial role in refining forensic evaluations

   Detecting malingering and assessing damage
4. Future research should focus on integrating AI with clinical expertise

   Continued research and integration will enhance forensic accuracy

Thank you for your attention




QUESTIONS
ANSWERS