

ETHICAL AND LEGAL FRONTIERS IN MILD TRAUMATIC BRAIN INJURY: NAVIGATING PATIENT CARE, CONSENT AND LIABILITY

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Abstract. *This paper examines the complex ethical dilemmas and legal challenges in the management of mild Traumatic Brain Injuries (mTBIs), focusing on issues of autonomy, beneficence, non-maleficence, justice, liability, compensation, and insurance. Through a comprehensive literature review and analysis, we explore the current medical understanding of mTBIs, including diagnosis, treatment, and prognosis, alongside the ethical considerations critical to patient care. Furthermore, we analyze medicolegal implications, highlighting the gaps and inconsistencies in existing legal frameworks that affect the management and protection of individuals with mTBIs. The paper proposes an integrated approach to address these challenges, emphasizing the need for enhanced clinical guidelines, legal reforms, interdisciplinary collaboration, and increased research funding. Our findings underscore the importance of developing standardized protocols that incorporate ethical principles and legal safeguards, ensuring equitable and effective management of mTBIs. Recommendations for policy and practice reforms are offered to improve patient outcomes and navigate the ethical and legal complexities associated with mTBIs.*

Keywords: Mild Traumatic Brain Injury (mTBI), Ethical considerations, Legal challenges, Patient autonomy, Informed consent, Liability and compensation, Interdisciplinary collaboration, Clinical guidelines, Medicolegal implications

DOI [10.56082/annalsarscibio.2024.1.153](https://doi.org/10.56082/annalsarscibio.2024.1.153)

INTRODUCTION

Background

Mild Traumatic Brain Injuries (mTBIs), commonly known as concussions, represent a significant portion of brain injuries worldwide, affecting millions annually across various demographics. mTBIs are characterized by a non-penetrative head

injury that results in a brief alteration in mental status or consciousness (1). The prevalence of mTBIs is particularly high in contact sports, military personnel, and individuals involved in vehicular accidents (1, 2). Despite their classification as "mild," these injuries can lead to a spectrum of short- and long-term neurological, cognitive, and psychological effects, including headaches, concentration difficulties, mood swings, and, in some cases, chronic traumatic encephalopathy (CTE), (2).

Importance

The management of mTBIs poses complex ethical and legal challenges. Ethically, it requires balancing the principles of beneficence, non-maleficence, autonomy, and justice in patient care. For instance, the determination of when an athlete or soldier with an mTBI is fit to return to duty or play encapsulates the ethical dilemma of beneficence versus non-maleficence. Legally, mTBIs invoke questions of liability, consent, and the adequacy of protective measures and protocols to prevent injury. Moreover, the sometimes subtle and subjective symptoms of mTBIs complicate diagnosis and treatment, further entangling the ethical and legal considerations in clinical and non-clinical settings (3).

Objective

This paper aims to explore the ethical dilemmas and medicolegal challenges inherent in the management of mTBIs. By examining the intersection of healthcare delivery, patient autonomy, and legal accountability, we seek to illuminate the complexities of mTBI management and propose frameworks for resolving these challenges. Specifically, we will analyze the implications of informed consent, confidentiality, liability, and patient care standards within the context of mTBIs.

Scope

The scope of this investigation is twofold. First, it encompasses the ethical considerations surrounding the diagnosis, treatment, and long-term management of mTBIs, including the challenges of informed consent and the balance between patient autonomy and healthcare provider responsibility. Second, it addresses the medicolegal implications, focusing on liability issues, the impact of legal standards on clinical practices, and the role of legislation in enhancing patient safety and care. Through this dual lens, the paper will contribute to the ongoing discourse on improving mTBI management practices, ensuring both ethical integrity and legal compliance.

Literature Review

Medical Aspects of mTBIs

Mild Traumatic Brain Injuries (mTBIs), encompassing concussions, are characterized by a transient alteration in brain function, often without structural damage visible on standard imaging (4). Diagnosis primarily relies on clinical assessment, including symptom checklists, cognitive testing, and sometimes

neuroimaging when more severe injuries need to be ruled out. The SCAT6 (Sport Concussion Assessment Tool, 6th edition) is widely used in sports for on-field assessment (5). Treatment strategies emphasize physical and cognitive rest, gradually returning to daily activities, and targeted therapies for persistent symptoms, underlining the individualized nature of mTBI management (6). Prognosis varies, with most individuals recovering fully within weeks to months, but a subset experiencing persistent post-concussion symptoms (4).

Ethical Analysis

Application of Ethical Principles in mTBIs

Autonomy: The principle of autonomy emphasizes respecting patients' rights to make informed decisions about their own care (7). In the context of mTBIs, this involves ensuring that patients understand their diagnosis, the potential outcomes of their injury, and the range of treatment options available, including the risks and benefits of each (8). The challenge lies in situations where mTBIs may impair cognitive function, complicating the capacity for informed decision-making.

Beneficence and Non-Maleficence: These principles entail acting in the best interest of the patient (beneficence) and avoiding harm (non-maleficence) (7). Healthcare providers must balance the immediate need to return patients to their daily lives with the potential long-term risks of returning too soon, especially in sports or military contexts (8). This balance requires careful assessment and management strategies that prioritize the patient's long-term health and well-being.

Justice: Justice relates to the fair distribution of resources and the equitable treatment of all patients (7). In managing mTBIs, this principle calls for ensuring that all individuals have access to the same standard of care, regardless of their socio-economic status, profession, or other factors (8). It also involves advocating for policies that protect vulnerable populations from the disproportionate impact of mTBIs.

Legal Analysis

Exploration of Legal Cases

National Football League (NFL) Concussion Litigation

One of the most publicized legal battles concerning mTBIs is the litigation involving former NFL players against the league. The plaintiffs accused the NFL of failing to protect players from concussions, not properly informing them of the risks associated with brain injuries, and the long-term health consequences of repeated mTBIs. The settlement, approved in 2015, provided up to \$5 million per retired player for serious medical conditions associated with repeated head trauma (9). This case brought widespread attention to the issue of concussions in sports and has led to increased research, protocol changes, and awareness of concussion management in professional sports leagues.

Workers' Compensation and mTBIs

Workers' compensation laws provide a framework for compensating employees who suffer injuries, including mTBIs, in the course of their employment. However, the complexity of diagnosing and proving the extent of an mTBI, coupled with varying state laws, can make it challenging for employees to receive adequate compensation.

Examination of Statutes and Regulations

Americans with Disabilities Act (ADA)

The ADA requires employers to make reasonable accommodations for employees with disabilities, which can include those suffering from the long-term effects of an mTBI. However, the application of the ADA to mTBIs can be complex due to the need to prove that the mTBI constitutes a disability under the law. This has implications for both employment practices and the rights of individuals with mTBIs to receive accommodations (10).

Legal Framework in the UK for mTBIs

Personal Injury Claims

In the UK, individuals who suffer mTBIs as a result of negligence can seek compensation through personal injury claims. The process is governed by UK tort law, specifically the law of negligence. Claimants must prove that the defendant owed them a duty of care, that the duty was breached, and that the breach caused the injury. Compensation can cover both physical and psychological injuries, as well as loss of earnings and future care needs (11).

Sports Regulations and Concussion Protocols

The management of concussions in sports has seen significant development in the UK. Governing bodies across various sports, such as rugby and football, have implemented concussion protocols to protect players. For example, the Rugby Football Union (RFU) in England has developed comprehensive concussion guidelines that include mandatory education, baseline testing, and graduated return-to-play protocols (12).

Workplace Safety and mTBIs

The Health and Safety at Work etc. Act 1974 is the primary piece of legislation governing workplace safety in the UK. Employers are required to ensure the health, safety, and welfare of their employees as far as is reasonably practicable, which includes taking steps to prevent mTBIs in the workplace (13). The Management of Health and Safety at Work Regulations 1999 further requires employers to assess risks and implement necessary measures to mitigate them.

Disability Discrimination and Accommodations

The Equality Act 2010 protects individuals with disabilities, including those who suffer long-term effects from mTBIs, from discrimination in the workplace and in

wider society. It requires employers and service providers to make reasonable adjustments for disabled individuals to ensure they are not at a substantial disadvantage compared to non-disabled individuals (14).

Challenges in Diagnosing and Proving the Extent of mTBI

One of the primary challenges in legal contexts is the difficulty in diagnosing mTBIs and proving their extent. mTBIs often do not leave visible marks on standard medical imaging techniques, such as CT scans or MRIs, making it challenging to provide objective evidence of injury in legal proceedings. Consequently, individuals may find it difficult to claim compensation or insurance benefits without concrete proof of injury.

Classification systems

The Mayo Classification System and the Glasgow Coma Scale (GCS) are both pivotal in the assessment and classification of traumatic brain injuries (TBIs), but they approach the task from different perspectives and with distinct methodologies. Each system has its unique strengths and applications in clinical practice and research, offering valuable insights into the severity and prognosis of TBIs.

Glasgow Coma Scale (GCS)

The GCS, developed in the early 1970s by Graham Teasdale and Bryan J. Jennett, is a clinical tool used to assess the level of consciousness in individuals who have suffered a head injury (15). It evaluates three aspects of responsiveness: eye opening, verbal response, and motor response. The total score ranges from 3 to 15, where a lower score indicates a more severe injury:

- Mild TBI: GCS score of 13 to 15
- Moderate TBI: GCS score of 9 to 12
- Severe TBI: GCS score of 3 to 8

The GCS is widely used for its simplicity, ease of application, and ability to provide a quick initial assessment of the injury's severity. It is particularly useful in acute settings for triaging patients and making immediate clinical decisions.

Mayo Classification System

The Mayo Classification System, on the other hand, offers a broader approach to classifying TBIs. Developed by researchers at the Mayo Clinic, this system incorporates not only the severity of the brain injury but also takes into account the mechanism of injury, clinical symptoms, and imaging findings. It distinguishes between definite, probable, and possible TBIs based on a combination of factors including, but not limited to, loss of consciousness, post-traumatic amnesia, disorientation or confusion, and neurological signs. This classification system is especially useful for research purposes and in-depth clinical assessments, providing a comprehensive view of the injury (4, 16).

Comparison and Discussion

Scope and Application:

The GCS focuses primarily on the immediate assessment of consciousness level after a TBI, making it an invaluable tool in emergency and acute care settings. Its simplicity and universality allow for quick decision-making and communication among healthcare providers.

The Mayo Classification System is more detailed and encompassing, making it better suited for research studies and the comprehensive management of TBIs. It allows for a nuanced understanding of the injury, which is crucial for long-term treatment planning and prognosis evaluation.

Strengths:

The GCS's strength lies in its simplicity and the ability to quickly triage patients based on their level of consciousness.

The Mayo Classification System's strength is its comprehensive approach, which considers a wider range of factors beyond immediate consciousness levels, offering a more detailed classification of TBI severity and type.

Limitations:

The GCS can be limited by its focus on consciousness alone, without accounting for other aspects of brain injury such as cognitive and behavioral changes that might not affect consciousness levels.

The Mayo Classification System, while comprehensive, requires more detailed information and assessments, which may not be readily available in emergency settings. It may also be more complex to apply consistently across different clinical settings.

In conclusion, both the GCS and the Mayo Classification System serve critical roles in the field of TBI care and research. The choice between them depends on the clinical setting, the purpose of the assessment, and the information available at the time of evaluation. In practice, these systems can be used complementarily, with the GCS providing an initial severity assessment and the Mayo system offering a more detailed classification to guide long-term management and research.

The role of expert witnesses

In the field of legal proceedings surrounding Traumatic Brain Injury (TBI) cases, the presence of expert witnesses like neurologists and neuropsychologists is not just helpful; it's pivotal. These professionals' step into the courtroom not merely as observers but as crucial narrators of a story that often remains hidden beneath medical records and imaging scans. They translate the complex language of brain science into narratives that judges, juries, and attorneys can understand and use to make informed decisions.

When a neurologist takes the stand, they bring with them a deep understanding of the nervous system's workings. They delve into the diagnosis of the TBI, dissecting the

severity and nuances of the brain's injury with precision and clarity. Their testimony weaves through the prognosis, offering a glimpse into the patient's future, marked by challenges and potential recoveries. They articulate the causation with care, tracing the line between the incident in question and the injury inflicted upon the brain, all while differentiating this new trauma from the shadows of past ailments or the possibilities of future ones.

As the neurologist outlines the treatment paths and rehabilitation needs, a picture emerges of the medical journey ahead for the patient, complete with its hurdles and milestones. They sketch the impact of the TBI on the individual's daily life, from the simplest tasks to the complex interplay of personal relationships, careers, and dreams, now all cast under the shadow of the injury.

Then, the narrative deepens as the neuropsychologist steps forward. With a focus on the mind's terrain, they explore the cognitive and psychological aftermath of the TBI. Through their expertise, the courtroom is introduced to the silent struggles that lurk behind the physical injuries: the battles with memory, attention, mood swings, and personality changes. They assess the individual's capacity to return to a semblance of their former life, highlighting the support needed to navigate this altered existence.

The neuropsychologist's role extends to linking the symptoms with the specific areas of the brain affected by the injury, offering a map of the damage that goes beyond visible scars. Their recommendations for therapy and accommodations shine a light on the path to recovery, emphasizing the tailored care required to address the unique challenges faced by the patient.

Together, the neurologist and neuropsychologist provide a comprehensive view of the TBI's impact, blending their insights to create a full picture of the patient's needs, challenges, and hopes for recovery. Their testimonies bridge the worlds of medicine and law, ensuring that the legal system's decisions are grounded in a deep understanding of the injury's true extent.

In the legal narrative of TBI cases, these expert witnesses are indispensable. They do not just present facts; they tell the story of the injury and its profound impact on a human life. Their voices ensure that the legal outcomes align with the principles of justice, compassion, and care, guiding the court to make decisions that reflect the complexities of living with a Traumatic Brain Injury. Through their expertise, the invisible becomes visible, and the silent speaks, marking their role as not just witnesses but as advocates for understanding, healing, and fairness.

Current Legal Frameworks:

Legal frameworks that rely heavily on tangible evidence of injury may not adequately protect individuals with mTBIs. Legal and insurance systems may not fully accommodate the unpredictable nature of mTBIs. Compensation schemes often use standardized tables to determine benefits, which may not accurately reflect the individual experiences of those with mTBIs. Personal injury law, workers'

compensation systems, and disability benefits programs often require clear medical evidence to support claims of injury and impairment. The reliance on physical evidence of injury in legal proceedings can disadvantage individuals with mTBIs, whose primary symptoms may be cognitive or psychological and not easily quantifiable through traditional medical imaging.

There is a need for legal frameworks to adopt more flexible approaches that can account for the wide range of recovery outcomes associated with mTBIs. This might include provisions for reassessment and adjustment of benefits as the individual's condition evolves.

Variability in Treatment Responses

The variability in how individuals respond to treatment for mTBIs adds another layer of complexity. Recovery trajectories can vary widely, with some individuals experiencing symptoms that persist for months or years, while others recover quickly (17,18). This variability can make it challenging to predict outcomes and determine appropriate compensation or support levels.

Potential for Long-term Impairments

The potential for long-term impairments following an mTBI is well-documented, with some individuals experiencing chronic symptoms that can affect their ability to work, engage in social activities, and maintain their quality of life (19,20). These long-term effects pose significant challenges for legal frameworks designed to provide compensation and support. While some legal systems have made progress in recognizing the long-term effects of mTBIs, others lag behind, often treating mTBIs as short-term injuries with expected full recovery. Disability laws and insurance policies may not always recognize the chronic nature of some mTBI symptoms, limiting access to long-term support and accommodations for those affected.

Recommendations for Improvement

To better protect individuals with mTBIs, several improvements to existing legal frameworks are necessary:

- Enhanced Recognition of mTBIs: Legal and insurance frameworks need to evolve to recognize the unique challenges of diagnosing and treating mTBIs. This includes accepting a broader range of medical evidence and expert testimony in legal proceedings to substantiate claims of injury and impairment.

- Flexible Compensation and Support Systems: Developing more flexible compensation and support systems that can adapt to the individual needs of those with mTBIs is crucial. This might involve periodic reassessments of an individual's condition and needs, with adjustments made to support and compensation accordingly.

- Acknowledgement of Long-term Effects: Legal frameworks must better acknowledge and accommodate the potential long-term effects of mTBIs. This includes provisions for ongoing medical care, rehabilitation services, and support for returning to work or other activities, as well as protections against discrimination.

Interdisciplinary Considerations

The integration of ethical and legal considerations into clinical guidelines for the management of mild Traumatic Brain Injuries (mTBIs) is crucial for ensuring that patient care aligns with both moral values and legal obligations. This integration is particularly important for aspects such as informed consent, patient autonomy, and equitable treatment. Clinical guidelines serve not only as a roadmap for care but also as a framework for upholding the rights and dignity of patients. Here, we explore how current clinical guidelines address these considerations and evaluate their sufficiency in guiding healthcare professionals.

Informed Consent

Clinical guidelines emphasize the importance of obtaining informed consent before conducting assessments or implementing treatment plans for mTBIs. The American College of Sports Medicine and the Concussion in Sport Group outline specific recommendations for assessing concussive injuries and stress the necessity of explaining the potential risks, benefits, and uncertainties related to concussion management strategies to patients or their guardians (21).

While guidelines advocate for informed consent, the challenge lies in ensuring patients or their guardians fully understand the implications of mTBIs, especially when cognitive impairments may affect their decision-making capacity. Guidelines could be improved by incorporating strategies for assessing decision-making capacity and providing recommendations for situations where obtaining informed consent is complicated by the patient's cognitive state.

Patient Autonomy

Guidelines from neurological and sports medicine organizations underscore the principle of patient autonomy, particularly in decisions related to return-to-play (RTP) or return-to-work (22 -24). The guidelines recommend that decisions should not only be based on clinical assessments but also take into account the patient's values, preferences, and goals.

The guidelines support patient autonomy but often assume a level of patient engagement and cognitive ability that may not be present in all cases of mTBI. There is room for guidelines to offer more detailed advice on engaging with patients who have varying levels of understanding and communication abilities, ensuring that autonomy is respected across a broader spectrum of cognitive function.

Equitable Treatment of Patients

Equitable treatment is a foundational ethical principle that is implicitly supported by the universal application of clinical guidelines for mTBI management, regardless of the patient's background or circumstances. Guidelines generally apply the same standards for diagnosis, treatment, and follow-up care to all patients suspected of having sustained an mTBI (21-24).

While guidelines promote equitable treatment in theory, they do not fully address disparities in access to care or differences in treatment based on socio-economic status,

geographical location, or healthcare system constraints. Enhancing guidelines to explicitly address these disparities and recommend strategies for ensuring equity in mTBI management could strengthen their ethical and legal robustness.

Recommendations for Improvement

- **Enhanced Decision-making Support:** Guidelines should provide clearer protocols for supporting decision-making in patients with compromised cognitive functions, ensuring that informed consent is genuinely informed and respecting patient autonomy even in challenging circumstances.

- **Addressing Disparities in Care:** Incorporate recommendations for identifying and overcoming barriers to equitable treatment, such as offering telehealth options for patients in remote areas or providing resources for those with limited access to specialized care.

- **Legal and Ethical Training:** Encourage or require ongoing education for healthcare providers on the legal and ethical aspects of mTBI management, including updates on relevant laws and ethical dilemmas related to consent, autonomy, and equity.

- **Interdisciplinary Collaboration:** Promote collaboration between healthcare providers, ethicists, and legal professionals in the development and revision of guidelines to ensure they comprehensively address the complex interplay of ethical and legal considerations in mTBI care.

DISCUSSION

These legal statutes underscore the ongoing challenges in adequately protecting and compensating individuals with mTBIs. While high-profile litigation like the NFL concussion case has raised awareness and led to changes in sports protocols, workers' compensation and disability rights laws still struggle to fully address the needs of those with mTBIs. The variability in how mTBIs are approached legally reflects broader uncertainties in the medical understanding of these injuries, their diagnosis, and their long-term impacts.

The evolving legal landscape suggests a need for clearer guidelines and more consistent application of laws to ensure that individuals with mTBIs receive appropriate care, accommodations, and compensation. Future legal reforms may benefit from a more nuanced understanding of mTBIs, supported by ongoing research and interdisciplinary collaboration between the legal and medical communities.

The UK's approach to managing mTBIs through legal and regulatory frameworks emphasizes prevention, protection, and compensation. Personal injury claims provide a mechanism for compensation, while sports regulations aim to reduce the incidence and impact of concussions. Workplace safety legislation mandates risk assessments and protective measures to prevent injuries, including mTBIs.

However, challenges remain in ensuring that these frameworks adequately address the complexities of mTBIs. Issues such as under-reporting of concussions in sports,

difficulties in enforcing workplace safety regulations, and the need for greater awareness and understanding of the long-term effects of mTBIs suggest areas for further development and research.

Future efforts in the UK may focus on enhancing legal protections, improving concussion protocols across all sports, and ensuring that individuals with mTBIs receive the support and accommodations they need. Continued collaboration between legal professionals, healthcare providers, and sports organizations will be crucial in advancing these goals.

Ethically, the principles of autonomy, beneficence, non-maleficence, and justice are at the forefront, presenting complex scenarios that require careful navigation to balance patient care with autonomy and informed consent, especially in cases where cognitive impairment may influence decision-making capabilities.

Our study underscores the need for comprehensive healthcare policies that reflect the complexities of mTBIs, emphasizing the development of standardized protocols for diagnosis, treatment, and return-to-activity decisions that are informed by ethical considerations and supported by legal frameworks. There is a pressing need for legal reform to address the gaps in liability and compensation related to mTBIs, ensuring that individuals receive adequate support and protection, particularly in work and sports environments where the risks of sustaining mTBIs are higher.

Current clinical guidelines for mTBI management incorporate ethical and legal considerations to varying degrees, particularly emphasizing informed consent and patient autonomy. However, there is a need for these guidelines to provide more explicit guidance on ensuring equitable treatment and navigating the challenges associated with patient decision-making capacity. Strengthening the integration of ethical and legal considerations will better equip healthcare providers to navigate the complexities of mTBI management while upholding the highest standards of patient care and rights.

Recommendations

- Enhance Clinical Guidelines:** Develop and implement more detailed clinical guidelines that integrate ethical considerations, such as patient autonomy and informed consent, into the management of mTBIs. These guidelines should also address the equitable distribution of resources and access to care for all individuals, regardless of their socio-economic status or occupation.

- Legal and Policy Reforms:** Advocate for legal and policy reforms that better protect individuals with mTBIs, focusing on improving compensation systems, insurance coverage, and workplace safety regulations. These reforms should aim to simplify the process of claiming compensation and ensure that legal frameworks are in place to support individuals through their recovery and beyond.

- Interdisciplinary Collaboration:** Promote interdisciplinary collaboration between healthcare providers, legal experts, and ethicists to ensure that mTBI management is

informed by a comprehensive understanding of the ethical, legal, and medical issues involved. This could include the formation of ethics committees or working groups dedicated to mTBIs.

- Public and Professional Education: Implement education programs for both the public and professionals (including healthcare providers, legal practitioners, and sports coaches) to raise awareness about the significance of mTBIs, the importance of appropriate management, and the ethical and legal considerations involved.

- Research Funding: Increase funding for research into mTBIs to further understand the long-term effects, improve diagnostic tools and treatment options, and develop effective prevention strategies. This research should also investigate the socio-economic impact of mTBIs and explore innovative solutions to the legal and ethical challenges identified.

Future Research

Future investigations should aim to close the current knowledge gaps regarding the long-term effects of mTBIs, the effectiveness of different management strategies, and the impact of legal and ethical considerations on patient outcomes. Research should also explore the development of technologies for better diagnosis and monitoring of mTBIs, the psychological and socio-economic impacts of these injuries, and the effectiveness of policy and legal reforms in improving patient care and protection.

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