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## Reconstruction of Criminal Responsibility for Misinterpretation of Radiological Images in Health Services Based on Legal Certainty and Substantive Justice

**Yuki Mulyani\*, Faisal Santiago**

Universitas Borobudur, Indonesia

Email: yukimulyani@yahoo.com\*, faisalsantiago@borobudur.ac.id

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### ABSTRACT

The advancement of radiology technology has significantly transformed healthcare services through the use of digital imaging systems, Picture Archiving and Communication Systems (PACS), and teleradiology. However, the increasing complexity of radiological image interpretation has also raised legal issues, particularly regarding the determination of criminal responsibility for misinterpretation that causes patient harm. The absence of clear legal parameters distinguishing professional error, negligence, and criminal malpractice creates uncertainty for both radiologists and patients. This study aims to reconstruct the model of criminal responsibility for radiologists in cases of radiological image misinterpretation based on the principles of legal certainty and substantive justice. This research employed a normative juridical method using statutory and analytical approaches by examining criminal law regulations, health law provisions, legal doctrines, and professional standards in radiology practice. The results indicate that the current legal framework does not provide specific criteria for determining when radiological errors constitute criminal negligence. The study finds that not all diagnostic errors should be criminalized because radiology involves scientific interpretation and inherent medical risks. Therefore, criminal liability should only be imposed on cases involving gross negligence that significantly deviates from professional standards (*lex artis*). The reconstruction model emphasizes harmonization between criminal law and medical disciplinary mechanisms, the application of *ultimum remedium* principles, and the development of clearer legal guidelines. This approach is expected to ensure balanced protection for medical professionals and patients while strengthening justice and legal certainty in healthcare services.

**Keywords:** Criminal Liability, Radiology, Medical Negligence

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### INTRODUCTION

The development of radiology technology in the last two decades has shown a significant transformation from conventional film-based systems to digital radiology, Picture Archiving and Communication Systems, and teleradiology, which allow image interpretation to be carried out across regions and even countries (Suandari, 2019). These changes increase diagnostic accuracy while expanding the technical complexity and professional responsibilities of radiologists. In the modern healthcare system, as regulated by Law Number 17 of 2023 concerning Health, medical personnel are required to provide services in accordance with professional standards and service standards. Radiological image interpretation is a central point in the clinical process because the results of radiological readings often determine the direction of definitive diagnoses, surgical procedures, drug therapy, and even life-saving decisions (Rachim, 2025). Thus, misinterpretation can no longer be positioned as a technical administrative error, but has the potential to cause serious harm to patient safety and give rise to legal consequences, including criminal liability if it meets the elements of negligence that cause consequences as formulated in Articles 359 and 360 of the Criminal Code concerning negligence causing death or injury (Fadlian, 2020).

The phenomenon of radiological image misinterpretation in empirical practice shows a broad spectrum, ranging from human error without gross culpability, to negligence in the form

of carelessness that exceeds professional standards, to malpractice that involves serious deviations from medical standards (Chafidhi, 2018). This distinction is important because criminal law requires an individual to be held accountable for an error (Schuld). In the context of the new Criminal Code, Law Number 1 of 2023, the principle of no crime without fault remains the fundamental foundation of criminal liability (Atmasasmita, 2017). However, in practice, it is not uncommon for radiological diagnostic errors that should fall within the realm of ethics or professional discipline to become criminal reports using Articles 359 or 360 of the Criminal Code (Anwar, 2023). When erroneous interpretations result in incorrect therapy or delayed medical treatment, resulting in patient disability or death, public pressure from the victim's family often prompts law enforcement officials to pursue criminal proceedings. This situation indicates that radiological errors have entered the realm of criminal law, necessitating clear normative parameters to prevent disproportionate criminalization (Bozbayindir 2018; Mulyani et al. 2025).

The fundamental problem lies in the unclear norms defining the boundary between professional negligence and criminal acts. The Criminal Code only provides a general definition of negligence without specific parameters for the medical profession, while health regulations emphasize professional standards and disciplinary mechanisms through medical personnel disciplinary boards. There is potential for overlap between the general criminal regime and the administrative-disciplinary health law regime (Novaković 2026; Tang 2021; Tresna et al. 2026). Law Number 17 of 2023 concerning Health regulates the obligation of medical personnel to comply with professional standards, but does not explicitly define when a violation of these standards constitutes a criminal offense (Abdurrahman, 2024). The lack of specific legal parameters regarding radiological misinterpretation has led law enforcement officials to use the general negligence standard, even though radiology practice is characterized by probability and scientific interpretation that does not always yield absolute certainty. This ambiguity has the potential to give rise to overcriminalization and defensive medicine, where radiologists are more focused on avoiding legal risks than optimizing the patient's medical interests (Jioe, 2025).

Doctrinally, criminal liability based on negligence requires a violation of the standard of care, the consequences of which should have been foreseeable by the perpetrator. However, the standard of care in criminal law is general and abstract, while in radiology practice, it is determined by professional standards, clinical guidelines, and the dynamic development of science. This discrepancy creates a gap between classical criminal law theory and modern medical reality (Caruso 2016; Dubber 2018; Hall et al. 2025). Proving errors in image interpretation also faces epistemological challenges, as radiological interpretations are often judgment-based and can differ between experts without necessarily indicating negligence (Fisher et al. 2015). In the judicial process, expert testimony is crucial evidence as stipulated in criminal procedure law, but the potential for medical forensic bias and differences in scientific schools of thought can influence judges' judgments. Without clear normative parameters regarding the limits of tolerance for professional error, the application of Articles 359 or 360 of the Criminal Code to radiologists risks ignoring the profession's characteristic of being based on scientific interpretation (Samrenaldy, 2025).

The tension between legal certainty and substantive justice is becoming increasingly apparent in medical cases. On the one hand, radiologists, as medical professionals, are entitled

to legal protection and the assurance that actions that comply with professional standards will not be automatically criminalized. On the other hand, patients, as subjects of the right to health, as guaranteed by the constitutional framework and laws, are entitled to protection when they suffer harm due to medical professional negligence (Lethy et al. 2023; Nevhutalu 2016; Wiley 2015). Criminal law in the health sector should ideally be positioned as the *ultimum remedium*, used when ethical, disciplinary, and civil mechanisms are inadequate to restore justice. However, in practice, the *ultimum remedium* paradigm is often neglected, resulting in criminal law becoming the *primum remedium* due to social and emotional pressure (Abdurrachman et al. 2021; Naibaho 2021). This situation demonstrates the unattainable balance between patient protection and the protection of medical professionals, ultimately disrupting legal certainty and a sense of substantive justice (Prabowo, 2024).

Based on this description, the urgency of reconstructing criminal liability in radiology practice is unavoidable. This reconstruction must be based on the characteristics of the radiology profession, which relies on scientific interpretation, professional standards, and developments in digital technology, and integrate these standards into the construction of criminal culpability in a more measured manner. Normative reformulation is needed to establish clear parameters regarding the degree of negligence that is punishable, so that not every misinterpretation automatically fulfills the element of criminal culpa. A proportional accountability model must place criminal law as the instrument of last resort, while still ensuring accountability in the event of gross negligence that results in serious consequences. Thus, this research has theoretical significance in enriching the doctrine of professional criminal liability, as well as practical significance in encouraging the reform of national health law to be more responsive to developments in radiology technology and ensure a balance between legal certainty and substantive justice.

## **METHOD**

This study employed a normative juridical method oriented towards the study of law as a written norm in the system of legislation and legal doctrine, by positioning law as a prescriptive rule to address the issue of norm ambiguity in criminal liability for misinterpretation of radiological images. The approaches used are the statutory approach and the analytical approach. The statutory approach is carried out by inventorying, reviewing, and systematizing various relevant regulations, including Law Number 1 of 2023 concerning the Criminal Code, provisions regarding negligence in Article 359 and Article 360 of the old Criminal Code which still have transitional relevance, Law Number 17 of 2023 concerning Health, as well as implementing regulations governing professional standards and discipline of medical personnel, to assess consistency, synchronization, and potential norm ambiguity. Meanwhile, an analytical approach is used to analyze key concepts such as culpa, professional negligence, the standard of care, and substantive justice through grammatical, systematic, and teleological interpretations, as well as an analysis of the doctrines and principles of criminal law, including the principle of legality and the principle of no punishment without fault. Through the combination of these two approaches, this study aims to build a coherent normative argument as a basis for reconstructing a more proportional model of criminal liability, providing legal certainty for radiology personnel, while guaranteeing legal protection for patients.

## **RESULTS AND DISCUSSION**

### **Normative Construction of Criminal Responsibility for Medical Personnel Negligence in the Indonesian Legal System**

The normative construction of criminal liability for medical personnel negligence in the Indonesian legal system is essentially based on the general regime of criminal law, specifically the provisions regarding the crime of culpa as stipulated in Articles 359 and 360 of the old Criminal Code, which are still used as references in practice, as well as its re-regulation in Law Number 1 of 2023 concerning the Criminal Code. Article 359 of the Criminal Code stipulates that anyone who, through negligence, causes the death of another person shall be punished, while Article 360 of the Criminal Code regulates negligence that causes serious injury or injury that prevents the person from carrying out their work. This formulation is general and does not differentiate between the professional characteristics of the perpetrator. Therefore, theoretically, it can be applied to medical personnel, including radiologists, as long as the elements of the act, the fault in the form of negligence, and the resulting consequences are met. However, in the context of the medical profession, which has specific expertise standards, the application of this general norm raises interpretive issues regarding the extent of criminal negligence (Pratami, 2024).

In criminal law doctrine, liability based on culpa requires a lack of care or failure to observe legal obligations, the consequences of which should have been foreseeable by the perpetrator. The principle is intertwined with the principle of "no crime without fault," as affirmed in Article 37 of Law Number 1 of 2023 concerning the Criminal Code, which stipulates that a person can only be punished if they commit a crime with fault. Therefore, fault is an essential element that cannot be ignored. However, in medical practice, particularly in radiology, which relies on image interpretation, not every error in the reading results can automatically qualify as criminal culpa. Objective parameters are needed to determine whether a radiologist has deviated from the professional standard of care that should be adhered to in a given situation. Without such parameters, there is a risk that any adverse outcome will be perceived as the result of criminal negligence, even though medicine recognizes inherent risks and limitations in diagnostic capabilities (Putra, 2018).

Law Number 17 of 2023 concerning Health emphasizes that medical and healthcare personnel, in carrying out their practice, are required to comply with established professional standards, service standards, and standard operating procedures. This obligation is a concrete manifestation of the professional standard of care. However, this law places greater emphasis on development, supervision, and disciplinary enforcement mechanisms through administrative and professional ethics systems. There is no explicit definition of when a violation of professional standards becomes a criminal offense. This creates a degree of normative ambiguity, as criminal law still allows for criminal prosecution under Articles 359 and 360 of the Criminal Code, while health law prioritizes resolution through disciplinary mechanisms. The absence of a clear bridging norm leaves law enforcement officials with broad discretion in determining whether a violation of professional standards is sufficiently resolved administratively or merits criminal prosecution (Ismail, 2025).

This normative ambiguity is further complicated by the interpretive and probabilistic nature of radiology practice. Radiologic image interpretation often involves clinical judgment

based on experience and the possibility of differential diagnoses, so differences of opinion between experts are not uncommon. If the standard for criminal negligence is measured by the general standard of care (*bonus pater familias*) without considering the professional standards of radiology, the complexity of medical practice is diminished. Strong legal arguments dictate that the assessment of the element of culpa in the context of medical personnel must not be separated from the professional standards in effect at the time the act was committed (*lex artis*). In other words, only a significant and scientifically unjustified deviation from *lex artis* can be considered a form of negligence that carries criminal merit.

The application of Articles 359 and 360 of the Indonesian Criminal Code to medical personnel must consider the principle of *ultimum remedium* in criminal health law. Criminal law should be a last resort when other mechanisms, such as civil liability or disciplinary sanctions, are inadequate to protect the violated legal interests. However, because the formulation of the crime of negligence in the Indonesian Criminal Code is open-ended and does not provide sectoral limitations, there is a tendency to use criminal law as the primary response to any alleged medical malpractice. This situation has the potential to shift the orientation of healthcare services toward defensive medicine, where medical personnel focus more on avoiding legal risks than optimizing patient interests. From the perspective of modern criminal law theory, criminalization without a clear distinction between professional risk and gross negligence contradicts the principles of proportionality and substantive justice.

The normative construction of criminal liability for medical personnel negligence in the current Indonesian legal system remains unclear in defining the boundaries of the transformation from a violation of professional standards to a criminal offense. The general formulation in Articles 359 and 360 of the Criminal Code and the affirmation of the principle of fault in Law Number 1 of 2023 have not been accompanied by sectoral parameters that take into account the specifics of medical practice, as stipulated in Law Number 17 of 2023 concerning Health. This lack of normative harmonization creates legal uncertainty for both medical personnel and patients. Therefore, a systematic and teleological reading of all relevant legal regimes is necessary to construct a more precise, proportional, and appropriate criminal liability structure that aligns with the characteristics of the crime.

### **Characteristics of Radiology Practice and Problems in Proving Image Interpretation Errors**

Radiology is a branch of medicine that relies on the use of imaging technologies such as X-rays, CT scans, MRIs, and other modalities to produce images of the anatomy and function of body organs, which are then professionally interpreted by a radiologist. The primary characteristic of this practice lies in its high-tech nature and scientific interpretation, so that the final results are not merely visible empirical facts, but rather professional conclusions derived from visual analysis, clinical correlation, and probabilistic considerations. In a legal context, this characteristic distinguishes radiology from more direct and case-based medical procedures, as errors often fall within the realm of scientific judgment. Therefore, when errors occur in reading or interpreting images, a careful distinction must be made between the inherent risks of medical practice and criminally responsible negligence.

Conceptually, a distinction must be made between diagnostic error, negligence, and malpractice. Diagnostic errors can occur as a result of human or technological limitations, without violating professional standards. Negligence involves an element of carelessness that

deviates from the standards of professional care that should be adhered to. Meanwhile, malpractice refers to a serious violation of professional standards that results in harm to patients. In Indonesian criminal law, specifically Articles 359 and 360 of the Criminal Code, the focus is on negligence (*culpa*) resulting in death or injury. However, the Criminal Code does not provide an operational definition of the degree of negligence relevant to the medical profession. Consequently, there is a tendency to equate every diagnostic error with criminal negligence, even though, doctrinally, not every error meets the elements of *culpa lata* or gross negligence that warrant punishment.

The main problem arises at the stage of proving the element of error in the criminal justice process. Based on Article 183 of the Criminal Procedure Code, a judge may not impose a sentence unless, based on at least two valid pieces of evidence, he or she is convinced that a crime has actually occurred and that the defendant is guilty of committing it. In cases of radiological misinterpretation, the evidence relies heavily on expert testimony, as stipulated in Article 184 paragraph (1) of the Criminal Procedure Code, which recognizes expert testimony as valid evidence. However, expert testimony in the field of radiology is often interpretative and allows for differences of opinion among experts. This situation creates the potential for epistemological bias, where assessments of professional standards of care can be influenced by scientific perspectives, experience, or even defensive tendencies within certain professional communities.

Within the framework of the principle of no punishment without fault, as affirmed in Article 37 of Law Number 1 of 2023 concerning the Criminal Code, proof of *culpa* must demonstrate a deviation that can be personally blamed on the perpetrator. In radiology practice, this deviation must be measured against the professional standards and standard operating procedures in effect at the time the act was committed, as required by Law Number 17 of 2023 concerning Health. However, radiology professional standards are dynamic and continually evolving in line with advances in technology and science. When criminal law uses a static general measure of care, there is a mismatch between the normative standards of criminal law and the technical-professional standards that serve as a reference for radiology practice. This mismatch has the potential to result in decisions that do not fully reflect scientific reality.

The technology-based nature of radiology also presents issues regarding the division of responsibility. Misinterpretation can be influenced by the quality of the equipment, digital system disruptions, limitations in the clinical data provided, or workload pressures within the healthcare system. If all legal consequences are individually imposed on radiologists without considering systemic factors, the construction of responsibility becomes reductive and unfair. Criminal law fundamentally upholds individual accountability, but in the context of modern, institutional, and collaborative healthcare, it is necessary to analyze whether the negligence was truly a personal error or part of a systemic failure. Without a comprehensive analysis, the application of Articles 359 and 360 of the Criminal Code to radiologists risks ignoring the complexity of causal relationships within medical care.

### **Reconstruction of the Criminal Liability Model for Radiologists Based on Legal Certainty and Substantive Justice**

Reconstructing the criminal liability model for radiologists must begin with a more precise legal definition of the degree of negligence that is punishable. Articles 359 and 360 of the Criminal Code currently use the general formulation "due to negligence" without any

differentiation into levels of culpa, even though medical practice recognizes a spectrum of errors ranging from professionally tolerable errors to gross negligence that clearly deviates from professional standards. Therefore, a systematic reinterpretation is needed based on Article 37 of Law Number 1 of 2023 concerning the Criminal Code, which emphasizes the principle of no crime without fault, by establishing only culpa lata, or gross negligence, as the basis for criminal punishment in the context of radiology. Concrete action that can be taken is to encourage the Supreme Court to issue a Supreme Court Regulation or a Supreme Court Circular Letter providing guidelines for judges in assessing the degree of negligence of medical personnel, including radiologists, so that not all diagnostic errors are automatically classified as criminal acts.

Furthermore, the integration of professional standards into the construction of the element of fault must be a normative prerequisite for proving culpa. Law Number 17 of 2023 concerning Health requires medical personnel to adhere to professional standards and standard operating procedures. However, this obligation has not been explicitly linked to the construction of criminal culpability. The proposed reconstruction is to make significant deviations from professional standards (*lex artis*) the primary criterion for determining criminal negligence. Concrete actions that can be taken include the establishment of implementing norms through Government Regulations or limited revisions to health laws that emphasize that criminal proceedings against medical personnel must be preceded by an ethical and disciplinary assessment by an authorized professional body as a preliminary professional review.

Affirming the principle of *ultimum remedium* in medical cases is also an essential part of the reconstruction model. Criminal law should not be the first response to every alleged radiological error. Before using criminal instruments, it must be ensured that professional disciplinary mechanisms and civil liability are inadequate to resolve the dispute. Normatively, this principle aligns with modern criminal law policy, which prioritizes proportionality and subsidiarity. A concrete action that can be taken is to include an explicit clause in health regulations or law enforcement guidelines stating that criminal reports against medical personnel must consider the results of the medical personnel disciplinary panel's examination as the initial basis for assessing whether there is any suspicion of gross negligence.

Harmonization between the criminal law regime and the professional disciplinary regime is also essential to prevent overcriminalization and defensive medicine. Currently, there is potential for overlap between disciplinary mechanisms and criminal proceedings, which operate in parallel without clear normative coordination. Reconstructing the accountability model must clearly define the relationship between the two regimes, so that the disciplinary process can function as a technical-professional clarification mechanism before cases reach the criminal realm. Concrete actions that can be taken include establishing a coordination protocol between law enforcement officials and professional disciplinary bodies through a national memorandum of understanding, as well as regulating the obligation to present official opinions from professional organizations as evidence considered by judges.

A proportional accountability model needs to accommodate the systemic dimensions of modern healthcare. Radiology does not exist in isolation but rather exists within a hospital system involving management, equipment, and administrative procedures. Reconstructing norms should open up the possibility of institutional accountability if misinterpretations are influenced by system failures, such as excessive workloads or substandard equipment.

Concrete actions that can be proposed include strengthening norms regarding corporate liability in the context of healthcare services and mandating regular clinical audits to prevent the recurrence of systemic errors.

A model of criminal liability for radiologists based on legal certainty and substantive justice must prioritize the balance between protecting medical personnel and protecting patients. Legal certainty for radiologists is achieved through clear parameters of negligence and transparent procedures, while substantive justice for patients is realized through access to redress and accountability for gross negligence. Concrete actions that can be implemented include developing national guidelines for handling medical criminal cases, providing ongoing education for law enforcement officers regarding the characteristics of the radiology profession, and strengthening penal mediation or restorative justice schemes in medical negligence cases that do not qualify as gross negligence. With these steps, national health law reform can move toward a fairer, more proportional, and more responsive accountability system to advances in radiology technology.

## **CONCLUSION**

Based on the overall discussion, it can be concluded that the normative construction of criminal liability for misinterpretation of radiological images in the Indonesian legal system remains unclear, particularly in defining the boundary between ethical-disciplinary professional error and criminal negligence. The general formulation of negligence in Articles 359 and 360 of the Criminal Code, and the affirmation of the principle of no crime without fault in Article 37 of Law Number 1 of 2023 concerning the Criminal Code, have not been fully integrated with the characteristics of radiology practice, which is based on scientific interpretation and professional standards, as stipulated in Law Number 17 of 2023 concerning Health. This lack of synchronization has implications for legal uncertainty, both for radiologists as legal subjects and for patients as victims, and has opened up space for overcriminalization and defensive medicine. Therefore, a reconstruction of criminal liability that places only gross negligence that clearly deviates from professional standards as the basis for punishment, and integrates *lex artis* into the construction of the element of fault, is an urgent need to achieve legal certainty and substantive justice. One suggestion is the need for regulatory reform and law enforcement policies that explicitly define the legal parameters of the degree of medical negligence that can be punished, including the affirmation of the principle of *ultimum remedium* in medical cases. Harmonization between the criminal law regime and the professional disciplinary regime must be strengthened through regulations that require an initial assessment by a medical disciplinary body before criminal proceedings are pursued, as well as the development of national guidelines for law enforcement officials in handling medical negligence cases in the field of radiology. Furthermore, it is necessary to develop a restorative justice-based resolution mechanism for cases that do not qualify as gross negligence and to increase the capacity of judges and law enforcement to understand the characteristics of radiology practice. With these steps, the criminal liability system in the health sector is expected to provide balanced protection for medical personnel and patients, while simultaneously encouraging the renewal of the national health law that is more responsive to technological developments and the dynamics of modern medical practice.

## REFERENCES

- Abdurrachman, H., et al. (2021). Application of *ultimum remedium* principles in progressive law perspective. *International Journal of Criminology and Sociology*, 10, 1012–1022.
- Abdurrachman, M. I. (2024). Analisis perbedaan prinsip kesalahan dan implikasinya terhadap tanggung jawab dalam perbuatan melawan hukum: Studi komparatif antara hukum Indonesia dan hukum Inggris. *Lex Patrimonium*, 5.
- Anwar, Y. T. (2023). Tanggung jawab hukum petugas fisikawan medis terhadap kualitas mutu pada izin operasional radiologi di Rumah Sakit Bhayangkara Banda Aceh. *SIBATIK Journal: Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, dan Pendidikan*, 2263–2282.
- Atmasasmita, R. (2017). *Rekonstruksi asas tiada pidana tanpa kesalahan*. Gramedia Pustaka Utama.
- Bozbayindir, A. E. (2018). The advent of preventive criminal law: An erosion of the traditional criminal law? In *Criminal Law Forum* (pp. 25–62). Springer.
- Caruso, G. D. (2016). Free will skepticism and criminal behavior: A public health-quarantine model. *Southwest Philosophy Review*, 32(1), 25–48.
- Chafidhi, A. N. (2018). Analisis pengulangan citra digital dengan menggunakan digital radiography di Instalasi Radiologi Rumah Sakit Panti Waluyo Surakarta. *RadX: Jurnal Ilmiah Radiologi*, 333.
- Dubber, M. D. (2018). *The dual penal state: The crisis of criminal law in comparative-historical perspective*. Oxford University Press.
- Fadlian, A. (2020). Pertanggungjawaban pidana dalam suatu kerangka teoritis. *Jurnal Hukum Positum*, 10–19.
- Fisher, C. E., Faigman, D. L., & Appelbaum, P. S. (2015). Toward a jurisprudence of psychiatric evidence: Examining the challenges of reasoning from group data in psychiatry to individual decisions in the law. *University of Miami Law Review*, 69(3), 685–748.
- Hall, S., & Winlow, S. (2025). *Revitalizing criminological theory: Advances in ultra-realism*. Routledge.
- Ismail, M. Y. (2025). Pendekatan forensik dalam kasus kekerasan terhadap anak: *Systematic review* atas bukti klinis, mediko-legal, dan yuridis global. *Jurnal Sosial dan Sains*, 1222.
- Jioe, H. S. (2025). Tinjauan yuridis-normatif penggunaan kecerdasan buatan dalam diagnostik medis. *JlIP: Jurnal Ilmiah Ilmu Pendidikan*, 11703–11710.
- Lethy, Y. N., et al. (2023). Legal protection for patients against negligence of medical personnel. *International Journal of Service Science, Management, Engineering, and Technology*, 4(2), 39–43.
- Mulyani, Y., & Budianto, A. (2025). Malpractice law update on radiologists' liability in cases of diagnostic errors and standards of practice. *Greenation International Journal of Law and Social Sciences*, 3(3), 1340–1348.
- Naibaho, N. (2021). Rethinking the *ultimum remedium* principle to support justice and strong law enforcement institutions in environmental crimes. In *IOP Conference Series: Earth and Environmental Science*. IOP Publishing.
- Nevhutalu, H. K. (2016). *Patient's rights in South Africa's public health system: Moral-critical perspectives*.
- Novaković, S. (2026). *Rethinking police discipline: A comparative argument for criminalizing police misconduct* (SSRN Working Paper No. 6424458).
- Prabowo, Y. E. (2024). Aspek medikolegal diskrepansi diagnosa. *Proceeding Masyarakat Hukum Kesehatan Indonesia*, 477–488.
- Pratami, N. R. (2024). Analisis hukum terhadap peran *artificial intelligence* (AI) dalam

- diagnostik medis: Kewenangan dan tanggung jawab hukum. *INFOKOM (Informatika & Komputer)*, 84–93.
- Putra, A. B. (2018). Legal aspect of teleradiology at hospital in fulfillment of patient right. *Soepra Jurnal Hukum Kesehatan*, 327–341.
- Rachim, A. (2025). *Pemasaran kebijakan publik: Membangun sistem pelayanan kesehatan berbasis masyarakat*. Star Digital Publishing.
- Samrenaldy, N., et al. (2025). Analisis hukum terhadap penggunaan *artificial intelligence* (AI) dalam menentukan diagnosis medis di Indonesia. *Jurnal Intelek Insan Cendikia*, 17207–17217.
- Suandari, P. V. (2019). Evaluasi implementasi *Radiology Information System Picture Archiving and Communication System* (RISPACS) dengan pendekatan model HOT-FIT. *Jurnal Sistem Informasi Bisnis*, 55–62.
- Tang, C. (2021). Medical negligence dispute resolution in China: Social stability and preventative measures. *Amicus Curiae*, 2(2), 268–289.
- Tresna, I. K., Pattynama, F. M., & Romadhon, A. H. (2026). Legal responsibility of military doctors in Indonesia: A study of military and health law. *KASTA: Jurnal Ilmu Sosial, Agama, Budaya dan Terapan*, 6(1), 111–124.
- Wiley, L. F. (2015). From patient rights to health justice: Securing the public's interest in affordable, high-quality health care. *High-Quality Health Care*.