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To Stent or Not to Stent: That's Just the First Question

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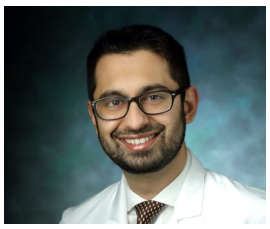

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Airway stenting has long been a significant part of the interventional bronchoscopist's repertoire when it comes to endoscopic management of malignant central airway obstruction (MCAO). However, there is marked variability in how and when this intervention is offered.[1,2] Even the generally held notion that stenting should be reserved for cases involving extrinsic airway compression (whether exclusively or combined with endoluminal disease) is not universally adhered to.[3] Perhaps unsurprisingly, no guidelines had previously been published to help clinicians on this subject.

That changed with the recent publication of the World Association for Bronchology and Interventional Pulmonology (WABIP) guidelines on airway stenting for MCAO.[4] A group of 17 experts across 11 countries spanning four continents addressed six important questions with mutual consensus (using the modified Delphi technique) based largely on a systematic review of published literature.

Only one of the six recommendations was graded as "strong" - namely that airway stenting be considered in patients with MCAO receiving mechanical ventilation - although the supporting evidence based on retrospective observational data was judged to be of low quality (grade 1C recommendation).[5] Weak recommendations - made based on sometimes conflicting evidence that was deemed low-to-moderate quality - were also made to consider airway stenting as a means to improve quality of life, performance status, and survival. Another weak recommendation (grade 2C) was to perform surveillance bronchoscopies to detect stent-related complications in asymptomatic patients, with the first surveillance bronchoscopy scheduled 4-6 weeks after stenting. Across all clinical scenarios, the expert panel determined that no conclusive evidence supported the selection of one over the other commercially available stent type (silicone versus metallic). Finally, in the absence of any evidence for or against it, the group's consensus was in favor of undertaking pulmonary hygiene measures such as saline nebulization to reduce the risk of stent-related complications (nine experts strongly agreed, seven agreed, and one neither agreed nor disagreed).

So, how does the bronchoscopist incorporate these guidelines going forward? The very first question facing every bronchoscopist is whether to stent or not. Hamstrung by limited scientific evidence, these guidelines partially help answer this question. However, the role of ascertaining the degree of airway obstruction in making treatment decisions remains unclear. For example, if there is no respiratory distress or other signs and symptoms attributable to MCAO, what if any is the minimum degree of extrinsic airway compression that warrants airway stenting? Does that vary with the location of MCAO (e.g., trachea versus a mainstem bronchus versus bronchus intermedius)? What is an appropriate metric for quantifying airway obstruction? Is it airway diameter, airway cross-sectional area, length of airway affected, and/or drop in airway pressure across the affected segment? What is a valid means of measuring airway size? Is it the bronchoscopist's estimate based on endoscopic images, automated measurements on segmented endoscopic images, pre-operative or intraoperative computed tomographic imaging (static or dynamic), or bronchoscopic tools such as a calibrated airway balloon? Of course, lest we forget, to stent or not to stent is merely the first question out of many. The remaining questions - including but not

limited to stent selection, airway hygiene regimen, duration of stenting, and surveillance regimen - warrant further investigation as aptly highlighted by these guidelines.

The WABIP guideline panel is to be congratulated for producing this valuable addition to the body of medical literature. In addition to highlighting the potential of airway stenting for improving clinical outcomes, particularly liberation from mechanical ventilation, these guidelines provide needs assessment for future investigators as they seek more precise answers to several important questions. The journey to discovery is not easy, as exemplified by a commendable randomized study that was stopped far short of target enrollment.[3] But, as the WABIP guideline panel has successfully demonstrated, there is a first time for everything.

References:

1. Dutau H et al. *Respiration; international review of thoracic diseases.* 2018;95(1):44-54.
2. Wayne MT et al. *Respiration; international review of thoracic diseases.* 2023;102(8):608-612.
3. Dutau H et al. *Respiration; international review of thoracic diseases.* 2020;99(4):344-352.
4. Chaddha U et al. *Respirol.* 2024;29(7):563-573.
5. Oki M et al. *J Thorac Dis.* 2017;9(9):3154-3160.

Technology Corner

Review on Artificial Intelligence in Interventional Pulmonology

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Introduction

Recent advancements in artificial intelligence (AI) technology have significantly impacted various fields. AI, which emulates human intelligence through computational systems, includes deep learning—a subset of machine learning that employs deep neural networks and other models to autonomously learn from data. This powerful technique enhances complex mathematical models for prediction, driving progress in areas such as image recognition, disease diagnosis, and prognosis prediction.

Background

AI technologies are extensively applied and researched in healthcare, including the field of pulmonary medicine. Over the past decade, automated chest X-ray image analysis techniques for early tuberculosis screening have rapidly evolved.[1] Several commercial products based on deep learning computer-aided detection (CADe) systems for pulmonary tuberculosis are now available.[2] AI-based computer-aided diagnosis (CADx) in addition to CADe systems are also employed for lung cancer screening and diagnosis.[3-6]

AI in the field of interventional pulmonology

AI in Airway Anatomy

Accurate transbronchial diagnosis for peripheral pulmonary lesions requires selecting the correct airway to reach the target.[7] Traditionally, bronchoscopists view two-dimensional (2-D) axial, coronal, and sagittal CT views and reconstruct a 3-D mental image of the path to the target lesion. However, this is challenging even for experienced bronchoscopists.[8] Automated bronchial tree labeling has been researched for more than two decades.[9, 10] AI-based bronchial tree labeling has been integrated into current navigation technologies; including virtual bronchoscopic navigation, electromagnetic navigation bronchoscopy, and augmented fluoroscopy. Even during bronchoscopic procedures, it can be difficult to determine which bronchus is being observed which can be especially difficult for novices or operators unfamiliar with bronchoscopy. AI models have shown high performance in anatomical identification using bronchoscopic video images and trained convolutional neural networks (CNN).[11-13] These promising results suggest that future AI-integrated devices could enable real-time bronchial anatomy identification. A recent study has trained AI to recognize depth within the bronchial lumen using bronchoscopic images generated from CT scans, allowing the AI to assist in steering a robotic bronchoscope to peripheral bronchi while maintaining a clear view of the bronchial lumen.[14] This 'AI co-pilot' technology is anticipated to be used clinically in the future, especially in robotic bronchoscopy, helping improve the learning curve for beginners.

AI in EBUS Images

Convex probe EBUS is widely used for lymph node staging in lung cancer and diagnosing mediastinal diseases due to its diagnostic efficacy and safety profile.[15] Categorizing lymph node features within EBUS B-mode images has been explored to distinguish between metastatic and benign lymph nodes.[16, 17] However, this method is inherently subjective and reliant on observer discretion. CADx has been reported for predicting lung cancer metastasis in lymph nodes using EBUS images. Early studies employed artificial neural networks with supervised learning on regions of interest from B-mode images.[18] However, these approaches relied on supervised selection of regions of interest, potentially limiting real-time applicability. Consequently, some researchers applied CNN to en-

tire EBUS images without selecting regions of interest,[19, 20] or to multi-modal images including EBUS, Doppler, and elastographic images,[21] yielding a high diagnostic accuracy. Similarly, AI-based CADx using radial probe EBUS images for peripheral pulmonary lesion diagnosis has demonstrated high performance.[22, 23] Currently, no commercially available AI-based systems offer real-time diagnosis prediction from EBUS images, but it is foreseeable that real-time differentiation between benign and malignant lesions in EBUS images will become a valuable clinical tool. This could enhance diagnostic yield by more accurate pre-test probability estimation before sampling.

AI in Cytology

Optimal diagnosis in interventional pulmonology, particularly through tissue sampling, can be enhanced by rapid on-site cytologic evaluation (ROSE).[24-26] However, the widespread adoption of ROSE faces challenges due to a shortage of experienced on-site cytopathologists and financial constraints. To address these issues, AI has been integrated with ROSE in research settings. High diagnostic performance has been demonstrated by inputting small pixel patches from cytology slide images into CNN models, enabling diagnosis within seconds.[27] A CNN-based system for categorizing cytology smear images obtained during ROSE in EBUS-TBNA has shown high accuracy in classifying adequate/inadequate samples, granulomas, and malignant cells.[28] Another AI-based ROSE system has also shown high diagnostic performance and consistency with experienced cytopathologists using external test datasets.[29] These advancements suggest that AI could enhance diagnostic accuracy and efficiency in cytology, providing substantial support in settings where experienced cytopathologists are unavailable.

Conclusion

The integration of AI into interventional pulmonology has the potential to improve diagnostic accuracy and patient safety. However, the clinical impact of AI-enhanced procedures remains to be fully established. Further research is needed to evaluate the clinical benefits and limitations of AI in interventional pulmonology, as well as to consider the anticipated increase in costs and assess their alignment with effectiveness.

References

1. Santosh KC et al. J Med Syst. 2022;46(11):82.
2. Hua D et al. Int J Med Inform. 2023;177(105159.
3. Thong LT et al. Lung Cancer. 2023;176(4-13.
4. Mikhael PG et al. J Clin Oncol. 2023;41(12):2191-2200.
5. Kanavati F et al. Sci Rep. 2020;10(1):9297.
6. Liu Q et al. Transl Lung Cancer Res. 2020;9(3):549-562.
7. Ishiwata T et al. Expert Rev Respir Med. 2019;13(9):885-897.
8. Dolina MY et al. Chest. 2008;133(4):897-905.
9. Kitaoka H et al. Medical Image Computing and Computer-Assisted Intervention — MICCAI 2002. Lecture Notes in Computer Science, vol 2489. Springer.
10. Ota S et al. Medical Imaging and Augmented Reality. MIAR 2008. Lecture Notes in Computer Science, vol 5128. Springer.
11. Yoo JY et al. Sci Rep. 2021;11(1):23765.
12. Li Y et al. Transl Lung Cancer Res. 2022;11(11):2261-2274.
13. Chen C et al. Ther Adv Chronic Dis. 2023;14(20406223231181495.
14. Zhang J et al. Nat Commun. 2024;15(1):241.
15. Dong X et al. Ann Thorac Surg. 2013;96(4):1502-1507.
16. Fujiwara T et al. Chest. 2010;138(3):641-647.
17. Hylton DA et al. J Thorac Cardiovasc Surg. 2020;159(6):2499-2507.e2493.
18. Tagaya et al. Chest. 2008;133(1):137-142.
19. Churchill IF et al. Ann Thorac Surg. 2022;114(1):248-256.
20. Ito Y et al. Cancers (Basel). 2022;14(14).
21. Li J et al. Endosc Ultrasound. 2021;10(5):361-371.
22. Chen CH et al. Comput Methods Programs Biomed. 2019;177(175-182.
23. Hotta T et al. Sci Rep. 2022;12(1):13710.
24. Oki M et al. Respiration. 2013;85(6):486-492.
25. Trisolini R et al. Chest. 2015;148(6):1430-1437.
26. Shikano K et al. J Thorac Dis. 2020;12(6):3057-3064.
27. Lin CK et al. Cancer Med. 2021;10(24):9047-9057.
28. Asfahan S et al. Eur Respir J. 2021;58(4).
29. Yan S et al. Front Oncol. 2024;14(1360831.

Steroid Injection for Benign Tracheal Stenosis

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Introduction:

Subglottic stenosis, which includes benign tracheal stenosis (TS) presents a complex airway condition typically attributed to prior history of endotracheal intubation and tracheostomy placement (1). In the absence of a known cause, it is known as idiopathic subglottic stenosis. Damage to respiratory tissues can be due to pressure necrosis, which triggers inflammation, leading to the development of granulation tissue and eventual formation of scar tissue that is akin to keloids in the skin (2). Input from a multidisciplinary team involving interventional pulmonology, otolaryngology, and thoracic surgery is often needed to optimize care for patients with TS. While open surgery offers definitive treatment, patients may not qualify due to their comorbidities and symptom severity necessitating an urgent intervention. As an alternative, endoscopic procedures focusing on scar resection, scar lysis, airway dilation, or a combination of these have become more common practice. However, a significant drawback of endoscopic treatment is rate of recurrence and the need for subsequent procedures (3). Serial intralesional steroid injection (SILSI), is an attractive option for decreasing the frequency of recurrence of benign TS in an office setting with readily accessible equipment and without the need for general anesthesia.

Rationale for using steroids:

Dermatologists have utilized intralesional steroids since the 1960s to modify skin scars (keloids), achieving response rates ranging from 50% to 100% with recurrence rates between 9% and 50% (4). Steroids effectively reduce inflammation that promotes scar formation by inhibiting collagen and glycosaminoglycan synthesis, encouraging fibroblast degeneration, and enhancing collagenase activity (5). They also inhibit inflammatory cell migration and cytokine production, such as transforming growth factor-β and interleukins, crucial in scar development (5). Steroids induce hypoxia and vasoconstriction, potentially reducing scar volume and softening scar tissue by limiting nutrient supply (5). Triamcinolone has been shown to be an effective intralesional treatment for keloids and hypertrophic scars as well as benign subglottic stenosis and TS (3,6,7). Here we discuss our institution's practice of office-based SILSI for management of TS.

Planning and Patient selection:

Patients selected for SILSI at our institution are those with idiopathic subglottic stenosis (iSGS) or iatrogenic SGS who have undergone multiple endoscopic dilations in the operating room (OR) and wish to prolong intraoperative interval and those with iSGS declining any surgical intervention. Franco et al. first proposed office-based SILSI as either a sole option or as an adjunct to surgery for patients with iSGS (3). Their group utilized spirometry to assess peak inspiratory flow (PIF) and peak expiratory flow (PEF), with the percentage of predicted peak expiratory flow (%PEF) serving as an indicator of stenosis severity before, during, and after treatment. Patients who were symptomatic with a % PEF below 50% and a PIF less than 1.5 L/sec were advised to undergo surgery. Discussing pros and cons of OR treatment vs. awake SILSI and considering patients' preference in the context of their current symptom burden is imperative to choosing the optimal treatment option. Most patients receive at least one operative dilation prior to starting SILSI.

Technique:

We perform our office-based SILSI through a transcervical approach. The procedure involves two operators: one controls the flexible laryngoscope while the other performs the injection. After obtaining informed consent, we first spray a combination of oxymetazoline and 4% lidocaine into the nasal cavity, followed by topical application of 4% lidocaine to anesthetize the oropharynx and hypopharynx. Next, we palpate the anterior neck to locate the cricothyroid space and infiltrate approximately 1mL of 2% lidocaine. At this time a tracheal block may also be performed. A flexible laryngoscope is passed through the nose past the level of the larynx to achieve a transglottic view of the subglottis. Under direct visualization, a 25-gauge needle is passed through the cricothyroid membrane and 2mL of Kenalog (40mg/mL) is injected circumferentially into the subglottis. Proper placement of steroid is confirmed by observing tissue blanching and wheal-like expansion within the subglottic scar. Counseling patients both before and during the procedure is essential, emphasizing the importance of slow, deep breathing and maintaining a calming environment.

Quality Control:

Key features of the area of stenosis, including position and degree of narrowing, are visually compared with video documentation at each follow-up visit to determine if there is disease progression, improvement, or stability. Spirometry results and patients' functional status are factored into the decision to continue or stop SILSI. Hoffman et al. evaluated patients undergoing SILSI for iSGS, 14 of 17 patients (82%) completing one series of injections did not require further operative intervention to date. For patients who completed two sets of three injections, average stenosis decreased significantly from 40% to 20% (8). Similarly, Bertelsen's study found that 17 of 24 patients (71%) did not need further surgery after SILSI during mean follow-up time of 32 months. When comparing surgery-free interval (SFI) before and after SILSI, SFI improved from 10.1 months before, to 22.6 months after SILSI (7). Current studies are limited by sample size, length of follow-up and rater bias of stenosis percentages.

Conclusion:

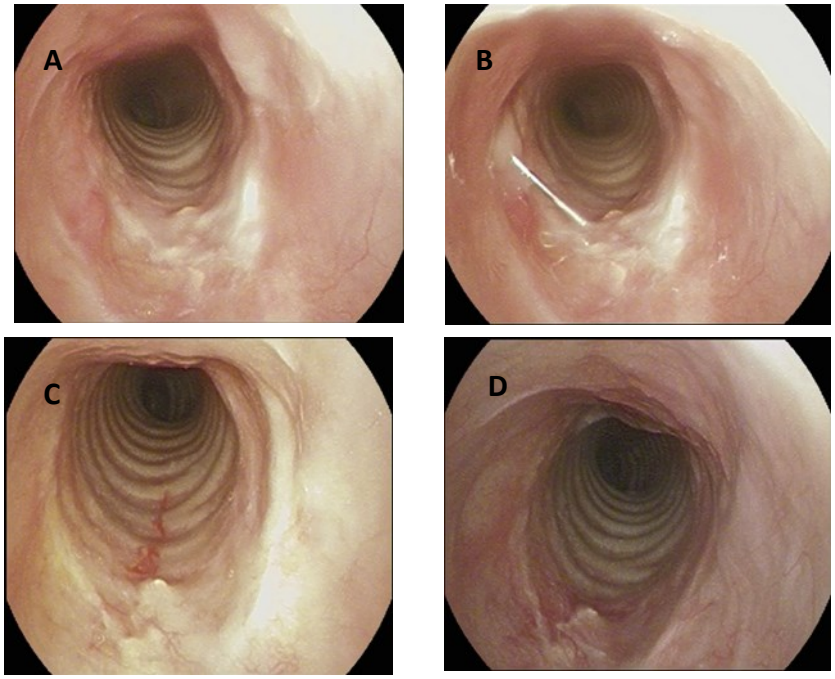
SILSI is a well-tolerated, safe, and effective treatment modality with the potential to alleviate the surgical burden on patients with benign TS. The effectiveness of SILSI has been shown in TS due to various etiologies including idiopathic, rheumatologic, and traumatic causes. In our clinical experience, we recommend SILSI as an adjunct to repeated endoscopic dilation.

Next steps and future directions

Further research into the frequency and interval between injections is needed to help optimize patient's symptoms and functional status and to risk stratify and identify possible responders.

References

1. Gelbard A et al. Laryngoscope. 2015; 125(5).
2. Nouraei SAR et al. Laryngoscope. 2006; 116.
3. Franco RA et al. Laryngoscope. 2018;128(3).
4. Robles DT et al. Clin Dermatol. 2007; 25(1).
5. Gauglitz GG et al. Molecular Medicine. 2011;17(1–2).
6. Ledon JA et al. Dermatologic Surgery. 2013; 39.
7. Bertelsen C et al. JAMA Otolaryngol Head Neck Surg. 2018;144(3).
8. Hoffman MR et al. Laryngoscope. 2017; 127 (2475-2481).



Fi**gure:** A – A patient with idiopathic subglottic stenosis who underwent dilation in the operating room. B – The patient retured two months later for SILSI. C - 1 month after SILSI. D – Significant improvement seen 10 months after two rounds of SILSI.

Democracy Under Siege: The Dual Threat of AI and Disinformation. Can We Safeguard Our Future?"

The digital age has ushered in an unprecedented era of technological advancements, revolutionising the ways in which we communicate, interact, and access information. However, this rapid progress has also given rise to a new frontier of cyber threats, characterised by their sophistication, adaptability, and far-reaching social implications.

The information age has inaugurated a period dominated not only by the dissemination of knowledge but also by the widespread propagation of misinformation and disinformation. The arrival of the information age has ushered in an era characterised not only by the worldwide distribution of knowledge but also by the extensive circulation of false and misleading information. Facilitated by the fast dissemination and extensive data processing capabilities of the internet, false information has become a powerful instrument in international competitions and domestic political disputes. Both governmental and non-governmental entities deploy false information to influence worldwide public sentiment, provoke chaos, and undermine confidence. Artificial intelligence (AI), specifically machine learning (ML), is intended to enhance these disinformation campaigns, which are clandestine operations specifically created to deliberately spread inaccurate or deceptive material. The emergence of AI-driven cyber manipulation is fundamentally changing the current state of affairs, modifying the dynamics of public discussion, and presenting a substantial obstacle to the integrity of democratic processes on a global scale.

Intentional disinformation campaigns are carefully planned and executed through well defined phases. Firstly, operatives engage in reconnaissance to observe their target area and perform thorough studies of the demographics they aim to manipulate. A fundamental infrastructure is developed, including of messengers, credible personalities, social media profiles, and groups to efficiently disseminate their stories. An uninterrupted stream of material, including written articles as well as multimedia elements like photographs, memes, and videos, is crucial to guarantee the spread and acceptance of their messaging. Once disseminated on the internet, these fragments of false information are magnified by automated bots, platform algorithms, and social engineering tactics to enhance their effectiveness and influence. However, much beyond simple distribution, the ultimate success often depends on continuous interaction with unwary users, accomplished through strategies similar to digital trolling, the combative counterpart in the domain of deception. In its final stages, a successful disinformation campaign alters public opinions, affects unwary individuals, and may even provoke disruptive behaviours, therefore sustaining disorder.

Irrespective of their source, disinformation campaigns that cultivate genuine followers can effortlessly assimilate into society conversations, obscuring the distinction between reality and falsehood and undermining public confidence. This process of erosion presents a significant obstacle to a society's capacity to differentiate between truth and deception, therefore giving rise to a persistent lack of trust.

Disinformation campaigns, albeit distinct in their particularities, exhibit shared features and adhere to identifiable patterns that take advantage of the structural features of social media platforms. Adopting a comprehensive paradigm to capture all misinformation operations is difficult because of the varied ecosystems of actors, strategies, and platforms involved. Moreover, the involvement of conventional media in this ecosystem, whether as a target, platform, or as a deliberate or unintentional facilitator of influence, introduces an additional level of intricacy. Consequently, the government, corporate sector, and civil society stakeholders involved in investigating, disrupting, and countering disinformation have not yet reached a consensus on a cohesive methodology to effectively address the danger posed by disinformation operations.

The potential influence of generative artificial intelligence (AI), namely large language models (LLMs), on democratic processes and citizenship is substantial. It is widely acknowledged among scholars that generative AI will have a significant impact on the information landscape and social media, both of which are essential components for democratic citizenship. The authors propose a hybrid methodology for comprehending these effects, acknowledging the complex interdependence of digital technologies with user interests and the blurred borders between online and offline domains.

Humanitarian News

Generative artificial intelligence (AI), particularly large language models (LLMs), is poised to significantly impact democratic processes and citizenship. Several researchers agree that generative AI will profoundly influence the information landscape and social media, which are crucial inputs for democratic citizenship. They advocate for a hybrid approach to understanding these impacts, recognising the intricate interconnectedness of digital technologies with user interests and the diffuse boundaries between online and offline spheres.

AI has the capacity to generate certain beneficial impacts on democratic citizenship. One potential benefit of AI is its ability to automate monotonous jobs, therefore allowing citizens to allocate their time and focus towards more significant political involvement. Furthermore, it has the potential to enable extensive political deliberations facilitated by artificial intelligence, surpassing geographical limitations. Furthermore, generative artificial intelligence has the capacity to improve the availability and analysis of information, so offering more carefully selected material to guide reasoning. By fostering democratic reciprocity and elevating the tone of talks, interactive Language Learning Modules (LLMs) have the potential to develop people' argumentative and deliberative abilities, hence boosting the quality of online political discussions. However, the majority of experts studying the phenomena of new technologies stress the need of examining generative AI in conjunction with social media, rather than in isolation. Their contention is that the collective impact of these technologies on the attention economy may have substantial social and political consequences. Within the framework of deliberative democracy, individuals are expected to cultivate certain values, like acknowledging others as equals, creatively embracing other perspectives, and exhibiting integrity and respect throughout discussions. Through the provision of balanced arguments, analysis of reasoning flaws, and facilitation of the comprehension of alternative viewpoints, generative AI has the ability to foster these deliberative virtues. Furthermore, it has the potential to tackle two notable deficiencies in deliberative democracy: argumentation inequity and scalability. By supporting individuals with limited communication and reasoning abilities, artificial intelligence (AI) has the potential to mitigate disparities in deliberation. Furthermore, its ability to scale up could surpass the practical constraints of extensive, high-quality deliberative participation, so enabling a more inclusive democratic process by providing information and engaging citizens, fostering civility and empathy. This has the potential to significantly enhance citizens' ability to engage in meaningful political discussions.

However, it must never be forgotten that AI is neither autonomous nor neutral; rather, it is laden with the intentions of those who shape its content. AI has the potential to produce low-quality, biased, or incorrect information due to hallucinations and biased training data. This could have serious consequences if citizens rely on such outputs for political deliberations and decision-making. Another significant threat is the proliferation of deepfakes and mass disinformation. The capacity of Generative AI to produce convincingly false content at scale could undermine trust in digital media and erode the foundations of informed democratic discourse. The potential for Generative AI to be weaponised in mass disinformation campaigns has been highlighted. Well-funded actors could flood the information landscape with false narratives, potentially dominating the attention economy and intensifying social division and distrust.

An additional risk is that Generative AI may diminish citizens' critical thinking and deliberation capabilities. By replacing the cognitive work necessary to understand complex issues, AI could stifle essential skills for a healthy democracy. There is also the risk that Generative AI could replace interpersonal interactions in political discourse, leading to a decline in direct engagement among citizens, which could damage the sense of belonging to a common political community. Several authors have warned of the possibility of an "infocalypse," in which citizens become unable to distinguish between real information and that manipulated by AI, potentially leading to a form of "Armed Skepticism," where truth becomes obscured amid conflicting narratives.

Although disinformation is not a new phenomenon, the advent of social media technologies has fundamentally altered the scale, reach, and accuracy of information dissemination in the digital age. The digital world has become a battleground for control of information, with malicious actors exploiting AI technology to create and disseminate disinformation on an unprecedented scale. By mimicking human behaviours and generating images and messages that resonate with audiences, these adversaries can subtly alter the truth, blurring the lines between fact and fiction. The power of AI-driven disinformation lies in its ability to exploit existing social divisions, amplifying controversial issues and exacerbating polarization. Safiya Umoja Noble's book, "Algorithms of Oppression" (2018), examines how search engines and AI systems can perpetuate racial and gender biases. She argues that these technologies, far from being neutral, often reflect and amplify social prejudices, which could undermine democratic principles of equality.In what has come to be termed the "information war," information becomes a weapon, and the minds of citizens become the battlefield. This strategy aims to polarise civil society, sow

chaos, and weaken opposing states. Far from being a mere dystopian hypothesis, this war is ongoing; it has dramatically influenced the positioning of unexpected individuals at the highest levels of government, is difficult to detect, and penetrates all levels of society at a relatively low cost. The ongoing information war, while lacking the overt violence of traditional combat, represents significant threats to nations, businesses, and citizens alike.

Democratic governments face the challenge of simultaneously ensuring citizens' access to reliable and objective information while avoiding acts of censorship. This necessity to avoid limiting freedom of expression leads to a reliance on large tech companies to oversee the online information environment, thereby granting powerful private entities—often resource-rich and with their own agendas and interests—the power of censorship.

One of the most well-known and painful examples for the healthcare community has been the disinformation campaigns conducted during the Covid-19 pandemic in Europe, which demonstrated the complexity of identifying the sources and large strategies behind these operations, given their multifaceted and often simultaneous nature. However, this also brings to light the geopolitical dimensions of cyberspace, revealing the risks of cybersecurity failures since the mid-2000s. Identifying sources of disinformation is particularly challenging due to the anonymous nature of cyberspace. Nevertheless, scholars have identified several categories of actors most likely to produce and disseminate false information, including far-right news sources, disinformation operations by foreign states, political parties promoting nationalist content, and profit-driven content producers exploiting the attention economy.

Cyberspace today represents both a domain for conflict and a means for states to advance their interests. The poorly regulated nature of cyberspace poses a significant challenge, as large-scale disinformation campaigns do not constitute acts of war that would justify conventional military responses. The unique characteristics of cyber conflicts, including the vulnerability of critical infrastructure, the ease of offensive operations, and the challenges of attribution and deterrence, render traditional military strategies insufficient. These factors have led some scholars to characterise cyber tools as "weapons of the weak," empowering states with fewer conventional military and economic resources.

With the ongoing progress of artificial intelligence technology, the possibility for increasingly intricate and compelling disinformation campaigns expands. The dynamic nature of this environment requires continuous study and the adjustment of strategies to protect the integrity of democratic procedures and public communication from these developing pressures. Although direct attacks on voting systems may result in time-limited interruptions, their influence is insignificant when compared to the enduring consequences of disinformation efforts. Through the exploitation of contentious matters and the fabrication of misleading stories, these malevolent activities gradually diminish confidence in the media and government, so weakening democratic institutions and exerting a more long-lasting impact on election results compared to deliberate hacking efforts.

Electoral misinformation tactics have repercussions that go beyond the mere fabrication of misleading narratives; they give rise to wider social discontent with extensive effects. Artificial intelligence (AI) powered operations exacerbate social tensions, leading to divisions that may be challenging to remediate. It is imperative for policymakers, technology corporations, and educators to establish a purposeful position in order to safeguard against these methods of attack and enhance social resilience to endure the increasing menace of digital propaganda. Furthermore, as Virginia Eubanks points out in her 2018 book "Automating Inequality," decision-making systems powered by artificial intelligence in public services have the potential to strengthen and worsen pre-existing social disparities. It is her contention that these mechanisms frequently exhibit prejudice against marginalised groups, therefore potentially compromising the democratic ideals of equality and justice.

The implications of these tactics are particularly concerning during electoral periods. A recent survey revealed that 77% of the French population believes that fake news significantly affects the democratic functioning of society, while 72% express concern about the influence of disinformation on voting. Furthermore, more than half of the respondents (55%) fear that disinformation campaigns could challenge the legitimacy of the results of the European elections. In 2021, 51% of internet users in France reported encountering news they considered false or unreliable on social media or news sites in the previous three months. The proliferation of false news has been alarming; between 2016 and 2017, the volume of tweets referencing false news doubled in France and quintupled globally. By 2019, there were approximately 45.5 million tweets worldwide discussing false news, with 1.7 million originating solely in France. In 2023, the monitoring organisation NewsGuard identified nearly 800 websites dedicated exclusively to publishing false stories.

Humanitarian News

Generative AI technologies, capable of producing text, images, and videos, have become widely accessible and are increasingly used to carry out disinformation campaigns. Large language models (LLMs), such as GPT-3, and generative adversarial networks (GANs) enable the creation of highly realistic fake news and manipulated media. These tools facilitate the dissemination of disinformation through social media platforms, including Facebook, X (formerly Twitter), and Instagram, where they can easily influence public opinion and electoral outcomes. The French Ministry of the Interior has identified foreign interference operations as a growing threat to democratic stability, underscoring the urgency of addressing this form of "informational insecurity." The challenge lies not only in the creation of disinformation but also in developing effective responses that leverage both AI and human analysis to detect, identify, and counter these threats.

A multifaceted strategy is essential to safeguard the authenticity of democratic processes in the face of the growing threat of AI-driven disinformation. This requires strategies that encompass collaboration across various sectors to effectively mitigate these threats.

Some of the proposed strategies to combat AI-driven disinformation include:

- Cyber Awareness Education from an Early Age

◊ Incorporating cyber awareness into educational curricula is imperative, given the alarming increase in AI-driven intrusions. This proactive educational strategy must extend beyond basic digital literacy to encompass critical thinking skills that empower students to question the validity and inherent biases of digital content. By fostering an environment where questioning and verifying online information becomes routine, we can equip future generations with the necessary tools to navigate the complexities of digital content. This training will enable them to discern reliable information from potential falsehoods, thereby enhancing their resilience against disinformation.

- Public Campaigns to Promote Critical Thinking and Media Literacy

◊ Public awareness campaigns aimed at improving media literacy across all age groups are vital. These campaigns should foster a comprehensive understanding of how information is created and disseminated online, enabling individuals to assess the credibility of the sources and content with which they engage. By cultivating an informed electorate, these initiatives can empower citizens to resist the influence of misleading data, which often has roots in deception. Such efforts not only reinforce individual critical thinking skills but also contribute to collective social resilience against the omnipresent threat of disinformation.

- Collaboration Between Governments, Technology Companies, and Civil Society

◊ Addressing the rampant spread of AI-driven disinformation requires collaborative approaches that bring together governments, technology companies, and civil society. These partnerships are essential for developing robust technological solutions and effective regulatory frameworks. By promoting the exchange of best practices and advancements in AI management, stakeholders can establish resilient systems that not only identify and counter disinformation but also uphold the principles of free expression and the dissemination of authentic information. Such collaboration is crucial for creating a united front against the multifaceted challenges posed by disinformation.

The complex issue of AI-driven disinformation represents a significant threat to the fundamental principles of democratic societies. The dual challenges of cyberattacks and the widespread dissemination of false information underscore the necessity of education as a dynamic defence strategy. By empowering individuals with the scepticism and knowledge required to navigate digital content intelligently, we can strengthen our democratic values. Policymakers, educators, and technology experts must prioritise investments in practical social solutions that address current threats while anticipating future risks associated with AI. Implementing regulations to hold platforms accountable for the content they generate is essential in this endeavour. By promoting awareness and fostering collaboration, we can fortify our democracies against the profound impacts of AI-facilitated disinformation, ensuring that the integrity of democratic processes is preserved for future generations. A distinguished investigative journalist such as Carole Cadwalladr, in her work on the Cambridge Analytica scandal, highlighted the potential of AI-driven microtargeting to manipulate democratic processes, prompting global debate and regulatory actions. Meanwhile, Jamie Susskind, in "Future Politics" (2018), explores how digital technologies are reshaping power relationships in society and warns of their potential to fundamentally alter our understanding and practice of democracy, which could lead to new forms of digital authoritarianism if not managed properly.

Humanitarian News

Advancements in artificial intelligence have revolutionised the ability to map and assess channels and messages of deception. Natural language processing (NLP) allows for the examination of communication exchanged on social media platforms, while machine learning methods, such as decision trees and long short-term memory (LSTM) networks, improve the identification of altered photos and texts. Artificial intelligence (AI) systems can undergo training to detect recurring patterns of false information on social media platforms and provide alerts on potentially detrimental material. Through the examination of data obtained from platforms like Twitter and Telegram, these systems have the capability to identify certain stylistic features commonly associated with false information. Consequently, they aid human operators in comprehending the characteristics of the content that is being flagged. Nevertheless, the efficacy of artificial intelligence (AI) in this field relies on the calibre of the training data and the cooperation between AI tools and human proficiency.

Undoubtedly, in order to avoid these possible negative consequences, this emerging phenomena requires detailed examination of laws and ethical principles. The updated EU AI Act seeks to govern deepfake operations by mandating that consumers of AI-generated material reveal any alterations made. Although regulation plays a crucial role in addressing disinformation, it is unable to completely reduce the dangers presented by enemies using comparable AI capabilities. Therefore, the battle against disinformation must employ the same AI-powered technologies that bad actors use, based on strong ethical principles that strengthen national sovereignty. The OECD report released on 4 March 2024 emphasises the need of a synchronised national approach to monitor disinformation on social media and ensure that citizens are informed about continuous attempts to intervene. Furthermore, this approach should prioritise the improvement of critical thinking abilities within the populace, namely through educational programs designed to increase knowledge of manipulation techniques.

Designing cutting-edge technologies to counter disinformation must adhere to legal and ethical norms, distinguishing democratic societies from non-democratic civilisations. Ensuring a climate of trust among stakeholders, such as researchers, industry leaders, and legislators, is essential for promoting collaboration across different sectors. A collaborative ecosystem should be established in order to develop efficient strategies to combat disinformation.

The influence of generative AI on the future of democracies has been the subject of extensive research and reflection within the academic sphere. Various social scientists have offered diverse perspectives on the present and future of democracies under the influence of artificial intelligence (AI).

Just to mention some few examples Shoshana Zuboff, in her seminal work "The Age of Surveillance Capitalism" (2019), argues that AI-driven data collection and analysis by tech giants pose a significant threat to democracy. She contends that these companies' ability to predict and influence human behaviour undermines individual autonomy and democratic decision-making, while warning that this "surveillance capitalism" could lead to a new form of social order that is incompatible with democratic governance. Meanwhile, Cass Sunstein, in "Republic.com 2.0" (2007), explores the concepts of "echo chambers" and "filter bubbles," predicting that these technologies could lead to greater polarization and fragmentation of the public sphere, potentially weakening democratic discourse. Digital platforms, facilitated by AI algorithms, consolidate echo chambers that reinforce cognitive biases and limit exposure to diverse perspectives. This not only intensifies polarization but also complicates citizens' ability to discern between truthful and false information.AI-driven disinformation contributes to a growing ideological divide, both politically and socially. This generates hostile environments where constructive dialogue is hindered, impeding the necessary collaboration to address global challenges such as climate change and economic inequality.

In "Network Propaganda" (2018), Yochai Benkler examines how digital technologies, including AI, affect the dissemination of disinformation and emphasises that the problem is not solely technological but also rooted in political and media structures. He proposes strengthening traditional journalistic institutions and media literacy to help mitigate the negative impacts of AI on democratic discourse.Finally, Evgeny Morozov, in works such as "To Save Everything, Click Here" (2013), critiques the notion that technology can solve complex social and political problems. He warns against "technological solutionism" and argues that excessive reliance on AI and other technologies could weaken democratic institutions and civic engagement.

This concise reference to academic stances indicates that the majority of scholars concur that, although AI poses substantial obstacles to democratic processes, its influence is not predestined. The importance of strong regulation, improved digital literacy, and a rethinking of democratic institutions is underscored to guarantee that AI functions to augment rather than weaken democratic principles. Furthermore, many emphasise the need of preserving human agency and supervision in AI-powered systems, especially those that impact public decision-making procedures. The consensus among these intellectuals

is that the fate of democracy in a world influenced by artificial intelligence will mostly hinge on the decisions made by societies regarding the development, implementation, and regulation of these technologies. They advocate for continuous public discussion and involvement in these matters to mould a future in which AI reinforces rather than replaces democratic ideals.

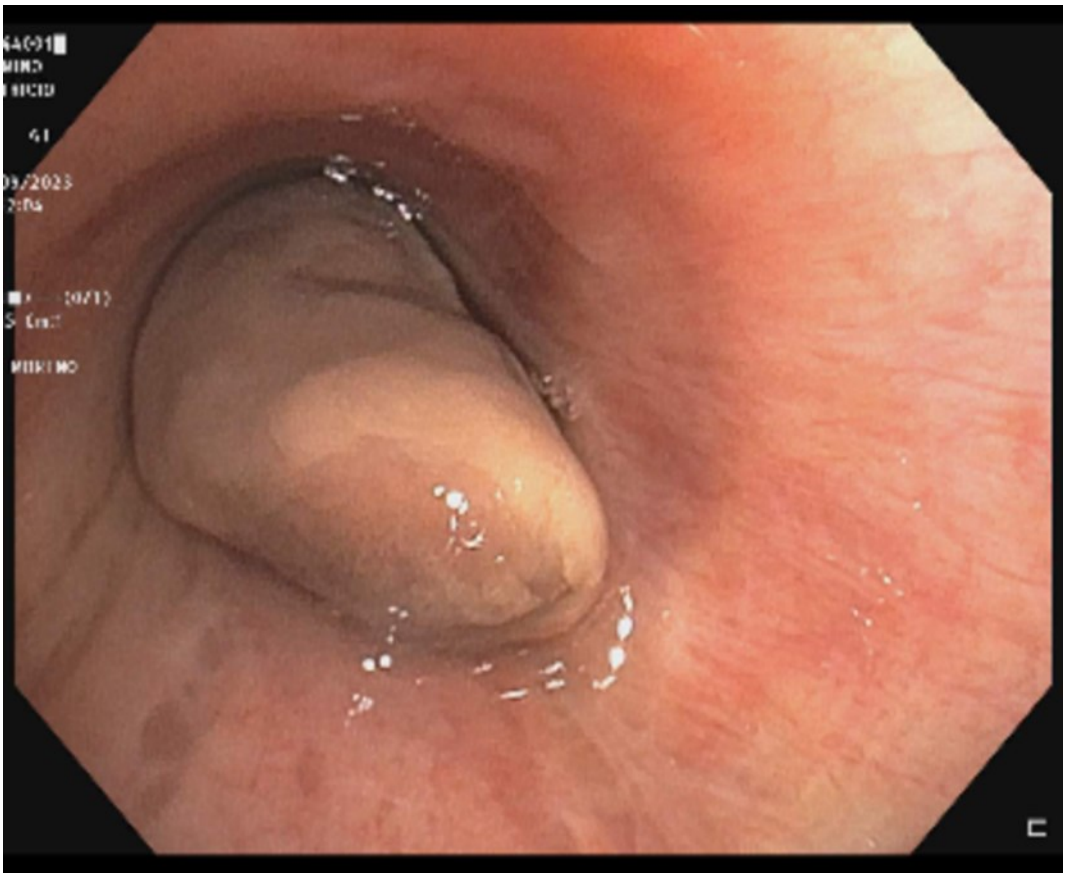
The responsibility lies with us to promote legislation that converts this powerful instrument into a mechanism for enhancing the quality of life for all individuals, or into another unfortunate failure that exacerbates disparities and gives rise to an authoritarian totalitarianism camouflaged as technological advancement.

References:
1. Benkler Y et al. (2018). Network propaganda: Manipulation, disinformation, and radicalization in American politics. Oxford University Press.
2. Dommett KE. Frontiers in Political Science. 2021: 3, 634074.
3. Eubanks V. (2018). Automating inequality: How high-tech tools profile, police, and punish the poor. St. Martin's Press.
4. Feldstein S. (2021). Artificial intelligence and democratic values: What's at stake? Carnegie Endowment for International Peace.
5. Kaye D. (2020). Artificial intelligence and its impact on freedom of expression. United Nations Human Rights Council.
6. Kreiss D et al. Political Communication. 2020: 37(5), 651-660.
7. Morozov E. (2013). To save everything, click here: The folly of technological solutionism. PublicAffairs.
8. Smith J. Journal of Political Science. 2023: 45(2), 123-145.
9. Sunstein CR. (2007). Republic.com 2.0. Princeton University Press.
10. Susskind J. (2018). Future politics: Living together in a world transformed by tech. Oxford University Press.
11. West DM. (2020). Artificial intelligence and the future of democracy. Brookings Institution.

**The views expressed in this article are those of the author (Silvia Quadrelli) and do not necessarily reflect the official positions of the Executive Board or International Board of Regents of the WABIP.*

Best Image Contest

Best Image Contest 2024 (3 of 3)



Category: Central Airway Diseases

Description: Endobronchial tumor lesion obstructing 80% of the lumen of the left main bronchus (metastatic myxoid epitheloid leiomyosarcoma).

Submitter(s): Claudia Liliana Moreno Diaz

This image is 1 of 3 selected among 100+ submissions to our Best Image Contest held in late 2023. Our next Image Contest will open later this year. We look forward to receiving your image submissions.

WABIP News

WCBIP 2024 CONGRESS

Preparations for the upcoming World Congress on Bronchology and Interventional Pulmonology (WCBIP) are well underway. The WABIP Executive Board and Board of Regents meetings are scheduled for October 23, 2024, in Bali. Pulmonology experts from around the world have been invited to serve as speakers and chairs for various sessions. Confirmations have been received, and a comprehensive list is being compiled to ensure a diverse and knowledgeable panel. The abstract submission process has concluded. Accepted abstracts have been compiled, and issues such as duplicate submissions have been resolved. The final list will be published for registered participants. The WABIP Media Committee is promoting the congress on social platforms. Visit the Bali Indonedia WCBIP website at https://www.wcbip2024.com

VIDEO FESTIVAL

The WABIP has finalized the results for its Video Festival, recognizing top contributions in various categories. The "Best Overall" video was awarded to "Bronchoscopic Recanalization of Complex Complete Tracheal Stenosis with Montgomery T-Tube Insertion and Follow-Up – A Case Study." This video will be shown at the Bali Congress. Other categories include "Best Scientific Content," "Best Innovation," and "Best Imaging," with winners being notified and certificates being prepared for presentation at the WCBIP 2024 in Bali.

WABIP INTERVENTIONAL PULMONOLOGY INSTITUTE (IPI)

WABIP is delighted to commence the acceptance process for its IPI fellowship program, with ten (10) candidates confirming their participation across various quarters of 2025. Additionally, inquiries regarding participation in the fellowship program for 2026 have been received from prospective candidates.

WABIP PAPER SUBMISSIONS

WABIP has published guidelines on airway stenting for malignant central airway obstruction (MCAO) for publication in the journal "Respirology," aimed at improving understanding and management practices in this area. Additionally, a white paper on radiation safety in bronchoscopy is available in its final version as an open-access article in "Respiration." It aims to educate pulmonologists on minimizing radiation exposure during procedures and has received endorsements from the European Association for Bronchology and Interventional Pulmonology (EABIP), with pending endorsements from the American Association for Bronchology and Interventional Pulmonology (AABIP). The topic will be addressed at a symposium during the WCBIP meeting in Bali.

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Artificial Intelligence is Not Yet More Intelligent than Organic Intelligence!

Artificial Intelligence (AI) was coined in the 1950s and has been a slowly evolving field since then. There is increasing interest in utilizing AI in medical applications. As in other fields, a time of great change may be approaching. Within the field of artificial intelligence, there are multiple subsets, such as machine learning, which is composed of the study of neural networks and further subdivided into deep learning, which ultimately branches into generative artificial intelligence. Each branch of the field of AI subdivides further as different techniques are applied.

Increasingly, there has been interest in applying different types of artificial intelligence approaches to specific problems in medicine. This free up clinicians time from repetitive and mundane aspects that can be automated. The detection of lung nodules on chest imaging studies can be an example of computer vision, where a model is trained on ways to identify lung nodules. This was first performed with image identification via a convolutional neural network in the ImageNet Trial. Applying these techniques to chest radiology is still nascent, but some approaches may have clinical applications sooner rather than later. There are already commercially available technologies, but it is important to understand the current technology and limitations to determine how best to implement the technology.

Currently, depending on the technology/technique, utilization of AI in chest radiology does not have a perfect sensitivity or specificity for identifying benign vs malignant lung nodules. However, there has been steady progress. There are two significant challenges: the first is identifying a lung nodule, and the second is risk stratifying the lung nodule to malignant vs non-malignant. Some studies, such as ANODE09 and LUNA16, focused on identifying lung nodules. Multiple competitions have utilized datasets of varying sizes to train AI models and compare them to experienced Radiologists. Although the initial trials did not demonstrate an advantage with AI, subsequent trials with the refinement of algorithms and AI techniques have resulted in situations where an AI model can perform similarly to a well-trained Radiologist. We have gone from receiver operating characteristic curves of 0.5 up to 0.9 in a short period of time.

These are promising results from these small studies, and there are some products commercially available that utilize some AI techniques. It may still take time for an AI model to work independently of a Radiologist, but with the current technology available, there is a role for assistive technology and workflow improvement. Certain AI models are able to easily identify lung nodules/abnormalities and then pass the task of interpretation to the radiologist. Some commercially available products can remove bone and/or blood vessels as part of imaging post-processing, which allows for identification of the nodules present. Other models have the opposite approach with nodules identified and the AI model identifying concerning characteristics. With either approach or a concurrent approach, workflow improvements in Radiology reads with improved standardization can be made. If the time needed to review, process, and interpret Radiology studies is reduced, this would ultimately allow for higher throughput and reduction in cost, all while further standardizing and optimizing the output. There are also studies that have demonstrated improved results with Radiologists working with AI tools. In this case, the sum is truly greater than the individual parts.

The use of AI in Radiology offers a glimpse into what a future of AI tools utilized in medicine could look like. There is, of course, skepticism and concern over how AI will change medical practice, but as with the industrial revolution, these new tools will allow us to be more productive. They will undoubtedly have unexpected consequences, but the technology is likely here to stay. The more we understand and utilize these new technologies as they continue the improve, the better we will be able to help the patients in front of us.

References:

1. **Kaul V et al. Gastrointest Endosc. 2020;92(4):807-812.**
2. **Liu JA et al. American Journal of Roentgenology. 2022;219(5):703-712.**
3. **Schreuder A et al. Transl Lung Cancer Res. 2021;10(5):2378-2388.**

WABIP ACADEMY- WEBCASTS

The WABIP has started a new education project recently: *THE WABIP ACADEMY.* The WABIP Academy will provide free online webcasts with new and hot topics that will interest pulmonologists and interventionalists.

Current webcast topic: **Tissue acquisition for biomarker directed therapy of NSCLC**

You can reach these webcasts by using this link: http://www.wabipacademy.com/webcast/

Links

www.bronchology.com	Home of the Journal of Bronchology
www.bronchoscopy.org	International educational website for bronchoscopy training with u-tube and facebook interfaces, numerous teachiing videos, and step by step testing and assess ment tools
www.aabronchology.org	American Association for Bronchology and I nterventional Pulmonology (AABIP)
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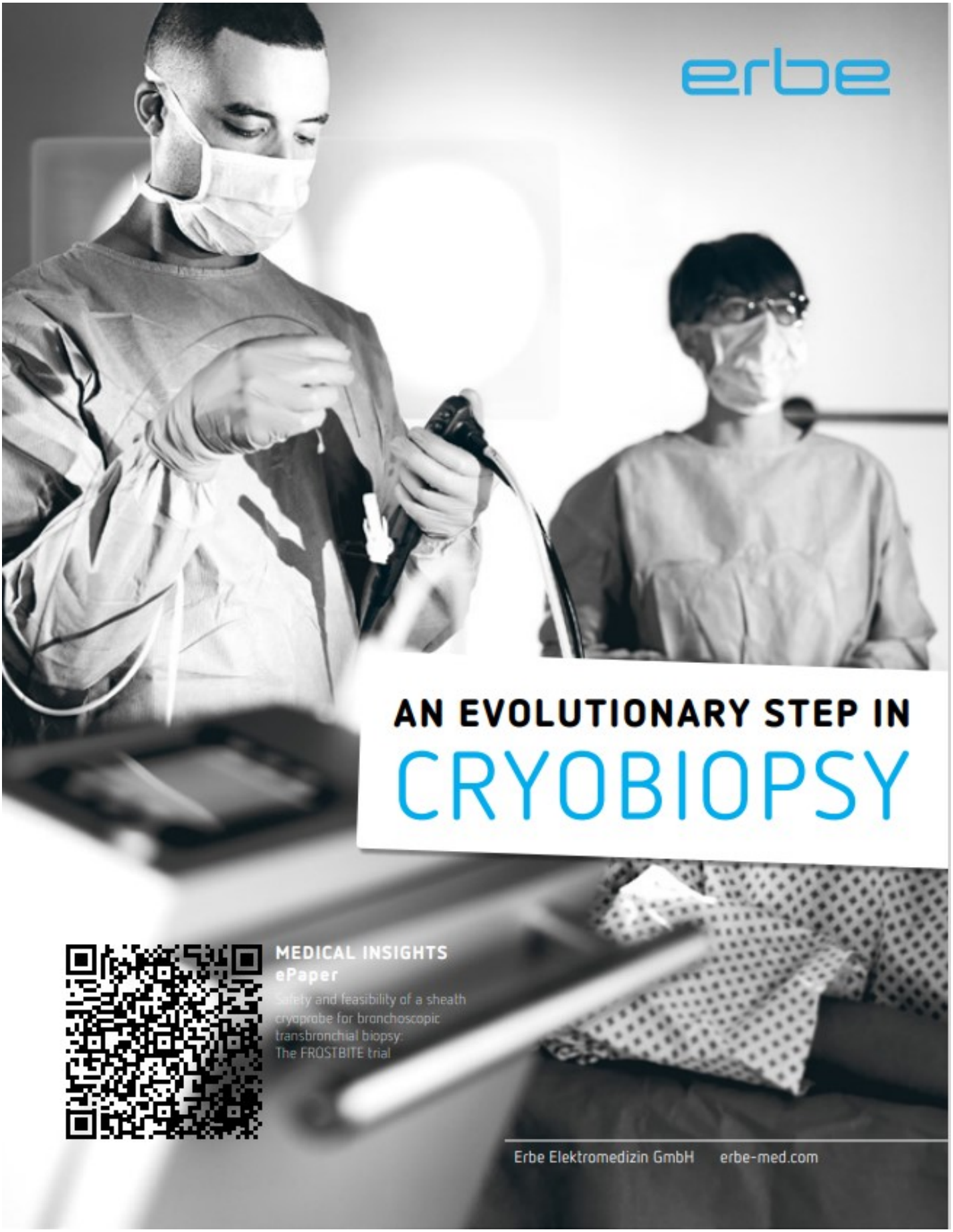
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