Thieme

Gastrointestinal endoscopy devices and the European Union Medical Device Regulation: European Society of Gastrointestinal Endoscopy (ESGE) Position Statement

Authors
Michael Bretthauer[1], Yuichi Mori[1,2], Jasmin Zessner-Spitzenberg[3], Michal F. Kaminski[4], Peter D. Siersema[5], Thierry Ponchon[6], Helmut Messmann[7], Ian M. Gralnek[8,9], Raf Bisschops[10], Cesare Hassan[11,12]

Institutions
1 Clinical Effectiveness Research Group, University of Oslo and Department of Transplantation Medicine, Oslo University Hospital, Oslo, Norway
2 Digestive Disease Center, Showa University Northern Yokohama Hospital, Yokohama, Japan
3 Medical University Vienna, Vienna, Austria
4 Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology, Warsaw, Poland
5 Department of Gastroenterology and Hepatology, Erasmus MC University Medical Center, Rotterdam, The Netherlands
6 Gastroenterology and Endoscopy Unit, Edouard Herriot Hospital, Hospices Civils de Lyon, Lyon, France
7 Department of Gastroenterology, University Hospital Augsburg, Augsburg, Germany
8 Ellen and Pinchas Mamber Institute of Gastroenterology and Hepatology, Emek Medical Center, Afula, Israel
9 Rappaport Faculty of Medicine Technion Israel Institute of Technology, Haifa, Israel
10 Department of Gastroenterology and Hepatology, University Hospitals Leuven, and TARGID, KU Leuven, Leuven, Belgium
11 Department of Biomedical Sciences, Humanitas University, Pieve Emanuele, Italy
12 Endoscopy Unit, Humanitas Clinical and Research Center – IRCCS, Rozzano, Italy

published online 20.4.2023

Bibliography
Endoscopy
DOI 10.1055/a-2052-2540
ISSN 0013-726X

Corresponding author
Michael Bretthauer, MD, PhD, University of Oslo, Clinical Effectiveness Research Group, Sognsvannsveien 21, 0372 Oslo, Norway
michael.bretthauer@medisin.uio.no

ABSTRACT

Gastrointestinal endoscopy is largely dependent on medical devices. The European Union (EU) has recently introduced stricter rules and regulations for the approval of medical devices. This has consequences both for endoscopists and for patients.

The new regulations increase the need for clinical trials and observational studies for new and current devices used in endoscopy to ensure clinical benefit and reduce patient harm. European endoscopy environments should facilitate industry-sponsored clinical trials and registry studies to meet the demand for robust data on endoscopic devices as required in the new legislation. The European Society of Gastrointestinal Endoscopy (ESGE) will play an active role in the establishment of the new system.

The EU is establishing independent expert panels for device regulation in gastroenterology and hepatology, including endoscopy, that are charged with assessing the requirements for device testing. The ESGE encourages endoscopists with expertise in the technical and clinical performance of endoscopy devices to apply for expert panel membership. The ESGE has provided information for interested endoscopists on the ESGE website.

Private European companies called “notified bodies” are entitled to conduct device approval for the EU. The ESGE will actively engage with these notified bodies for topics related to the new endoscopy device approval process to ensure continued access to high quality endoscopy devices for endoscopists in Europe.

Introduction

All procedures in gastrointestinal (GI) endoscopy are dependent on medical devices. This includes endoscopes and processors, water, suction, and CO_2 pumps, and a large variety of disposable devices such as snares, knives, biopsy forceps, stents, ligation bands, clips, and needles. Without proper and immediate access to these devices, the field of GI endoscopy would not be able to function in its entirety.

The European Union (EU) introduced stricter rules and regulations for the approval of medical devices in their new Medical Device Regulation (MDR), which became effective in May 2021 [1]. The MDR includes a transition period in which devices approved under the previous EU legislation (the Medical Device Directive [MDD]) need to be re-certified. This transition period was originally scheduled to expire in May 2024; in January 2023, the EU commission extended the transition period until December 2027 or December 2028, depending on the device risk class.

After these deadlines, all medical devices in Europe, current and new ones, will require certification under the new stricter rules. Devices that are not re-certified or do not meet the bar under the new rules will no longer be available for endoscopists in Europe. This will have far-reaching consequences for both endoscopists, patients, and healthcare systems.

This ESGE position paper summarizes the new requirements, discusses its implications, and aims to raise awareness of the challenges and opportunities for endoscopy services in the EU.

From old to new legislation

Under the old MDD legislation, a detailed assessment of the balance of clinical benefits versus potential harms was not required for many devices. The old legislation basically ensured that a medical device had the material qualities as described by the manufacturer. For many devices, manufacturers simply had to prove that a device made from plastic with a component of metal was indeed made of the designated components. The new EU MDR is profoundly changing this paradigm [2].

The European Parliament has passed the new MDR, which is applicable to all EU member countries and in the EU-affiliated countries Iceland, Liechtenstein, and Norway [1]. It replaces two previous laws, namely the MDD and the Directive on Active Implantable Medical Devices (AIMD). The new MDR is different from the previous legislation in the following areas of importance for endoscopists and patients.

Requirements for clinical benefit of endoscopic devices

Manufacturers of all endoscopic devices that are currently in clinical use must re-certify their devices under these stricter rules by 2027/2028. New devices entering the market from now on will be scrutinized more closely regarding their clinical benefits and patient harm, applying the new stricter legislation. Additionally, the MDR requests that manufacturers monitor the performance of their devices after marketing, called “post-marketing clinical follow-up (PMCF),” for the entire time a device is on the European market.

The bar for proof of clinical benefit is being raised most for devices in the highest risk classes (risk classes IIb and III). As a rule of thumb, devices that remain in the body for up to 30 days are class IIa, and those remaining longer than 30 days are class IIb [1]. Endoscopists use many IIa and IIb devices, such as biliary, enteral, or colonic stents, and full-thickness resection devices. Class III devices are not as common in endoscopy; these include devices in the central circulatory or nervous system, and all devices containing a drug or active compound (such as drug-eluting stents).

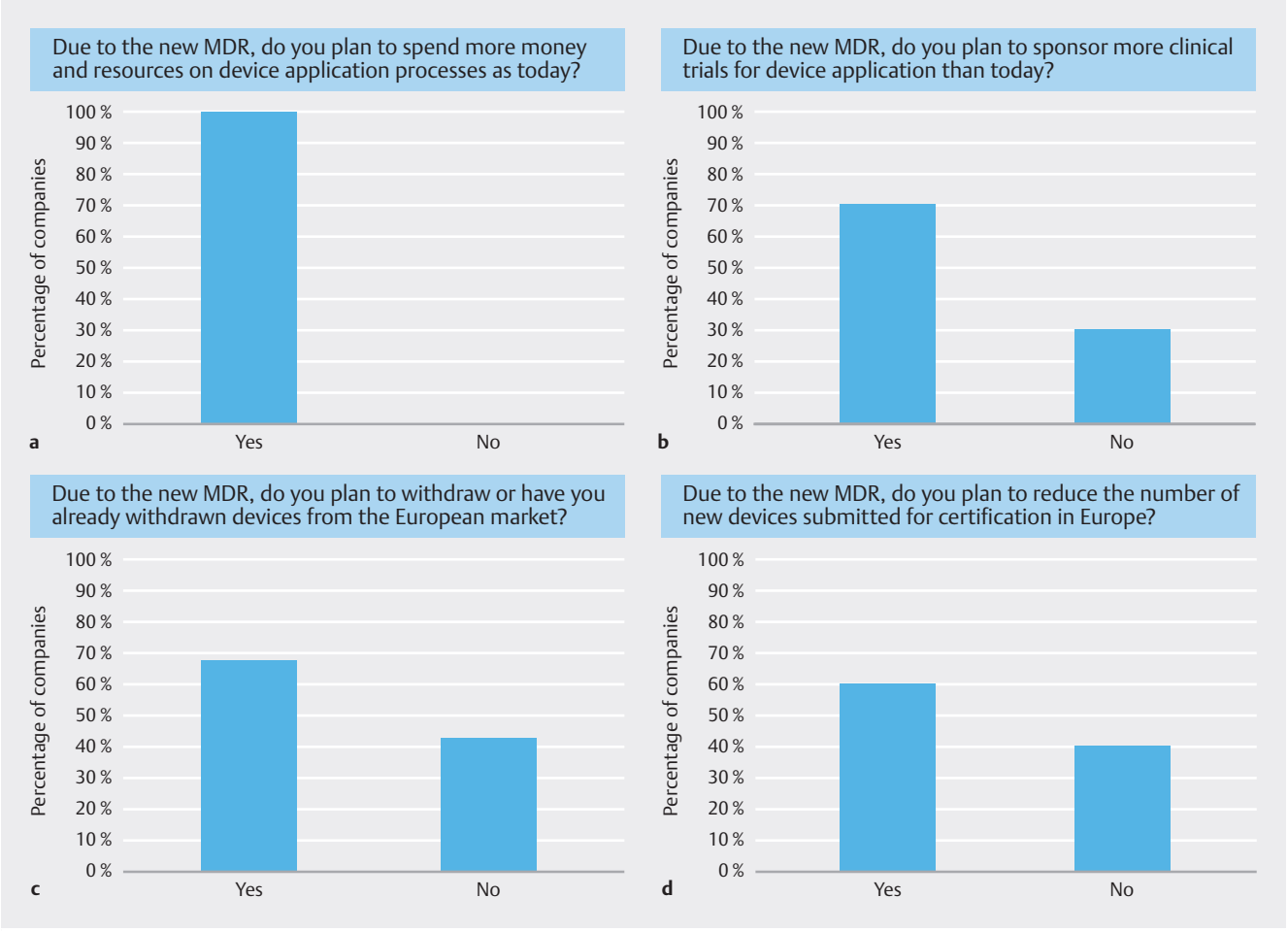
The MDR also defines endoscopic artificial intelligence (AI) products aiding endoscopists to make diagnostic or therapeutic decisions as medical devices. This includes computer-aided detection (CADe) and computer-aided diagnosis (CADx) tools in endoscopy. Separate legislation, the so-called “AI Act,” is planned by the EU to further define the future requirements related to computer algorithms and data security.

The ESGE expects that the new MDR will increase the need for clinical trials and observational studies for endoscopic devices in Europe. The ESGE will actively prepare European endoscopy environments to facilitate opportunities for more and better industry-sponsored clinical trials and registry studies to meet the demand for more robust data for endoscopic devices in the European market with “clinically relevant end points,” as required in the new MDR [1].

EU expert panel for endoscopy devices

The EU is currently establishing “independent expert panels” for device regulation in many areas of medicine. One of these expert panels has been established for “gastroenterology and hepatology,” including endoscopy [3]. These panels have between two and more than 30 members. The gastroenterology and hepatology panel has five members as of February 2023 [3].

The gastroenterology and hepatology panel will be responsible for the assessment of endoscopy devices, in liaison with the device companies who apply for certification and the notified bodies, who certify devices on behalf of the EU.



▶ **Fig. 1** Results of a survey of endoscopy device companies in Europe about the introduction of the European Union Medical Device Regulation (MDR) with regard to: **a** money and resources they expect to spend; **b** future trial sponsorship plans; **c** withdrawal of devices from the European market; **d** possible plans to reduce the number of new devices being submitted for certification. The survey was conducted as an anonymous web questionnaire in December 2022. It was sent to representatives of 15 companies and 10 replied.

The MDR requires that expert panels provide scientific guidance relating to clinical studies and relevant end points, patient numbers, and clinical development strategies. The panel also assesses the results of the requested clinical studies for device approval. The involvement of expert panels is explicitly required for devices in classes IIb and III.

Panel members are appointed by the European Commission based on clinical, scientific, or technical expertise. Experts may apply for panel membership directly to the EU through a dedicated web portal. Experts need to be citizens of an EU or EU-affiliated country, and should not have any conflicts of interest (e. g. collaboration or consultancy with the medical device industry) [3].

The ESGE encourages members with expertise in the testing of technical and clinical performance of endoscopic devices to apply for membership of the EU gastroenterology expert panel. The ESGE provides information for interested endoscopists on the ESGE website.

EU notified bodies

The EU has charged private companies with the handling of all aspects of device testing, including final approval for marketing. These companies are called notified bodies and have expertise in device testing, clinical trials, and regulatory processes. Currently, 36 companies in different European countries are approved by the EU as notified bodies [4].

Notified bodies communicate with device manufacturers and with the expert panels about the appropriate level of testing required for each device to be compliant with the MDR. Details for preclinical and clinical testing, including study design, study end points, and the number of patients needed to test the device before market approval, are negotiated between the three parties. After fulfilment of the requirements, the notified body grants marketing approval for the device and the manufacturer can start selling the device to endoscopy practices across Europe.

The ESGE will facilitate the three-party process of endoscopy device approval and will actively engage with notified bodies on topics relating to the new endoscopy device approval process.

Challenges and opportunities

These new regulations are challenging for many device manufacturers. The increased requirements for scientific studies and clinical trials increase the costs for device development and premarket approval. The process for device approval and maintenance of certification is time-consuming and resource intensive. Revenue margins will be challenged and, in turn, device costs for customers may increase significantly. This may be particularly true for small device manufacturers and start-up companies, who may find it difficult to raise funding to adhere to the stricter rules for device documentation and clinical testing.

A recent survey of the medical device industry in Europe showed that some device manufacturers are already reducing their activities around new devices and have stopped lines of development for new endoscopy equipment [5]. Some companies also report that they will withdraw their currently used endoscopy devices from the European market because they consider the re-certification process required by the new MDR to be too costly, time-consuming, and bureaucratic. So far, only about 15 % of all medical devices currently used in Europe have been re-certified under the new MDR [5].

In December 2022, the ESGE conducted an online survey investigating the status and prospects of the endoscopic device industry in Europe. The survey was sent to representatives of 15 companies and 10 replied. ▶ **Fig. 1** shows that companies that replied expect to spend more money and resources on device certification and engage in more clinical device trials in the years to come. Of concern, more than half of the companies are considering withdrawing or have already withdrawn endoscopic devices from the European market because of the new MDR, and 60 % of companies will be reducing the number of devices that they would normally send for market approval in the future.

The notified bodies and the EU expert panels have important roles under the new legislation. Major challenges include a lack of capacity at the notified bodies and the strict rules regarding conflicts of interest for experts, which may be difficult to apply because many experts are involved in the evaluation of medical devices together with the device manufacturers. These and other challenges may have forced the EU in the latter part of 2022 to realize that the original deadline for device transition in May 2024 would threaten access to important medical devices in Europe and jeopardize the quality of European healthcare. The recent extension of transition deadlines until 2027 or 2028 (depending on device class) will help notified bodies, clinical experts, and manufacturers to adjust to these new rules. There is however a large backlog for the re-certification of devices and it may not be realistic to re-certify all available devices, even by 2027/2028. Therefore, the GI endoscopy community needs to work efficiently to prepare and establish systems for proper device testing under the new EU legislation. The ESGE will facilitate the establishment of such systems and support industry, GI endoscopists, notified bodies, and patients to ensure continued access to high quality endoscopy practice in the future.

Acknowledgments

M. Bretthauer and Y. Mori: European Union Grant no. 101057099. Views and opinions expressed are those of the authors only and do not necessarily reflect those of the European Union or the Health and Digital Executive Agency.

Competing Interests

R. Bisschops has received speaker's and consultancy fees and research grants from Fujifilm, Pentax, Medtronic, and Norgine, consultancy fees from GI supply, CDX diagnostics, Boston Scientific, and Cook, and speaker's fees from Ipsen and Medivators. M. Bretthauer has received research support (loaned devices) from Olympus Corporation, and has provided consultancy to Paion (expert testimony) and Cybernet System. I.M. Gralnek has received research support from AstraZeneca and Check Cap, and has provided consultancy to Boston Scientific, Medtronic, Clexio Biosciences, Motus GI, Vifor Pharma, Neurogastrx, and Simbionix; he is on the medical advisory board of Motus GI. C. Hassan has received research support from Fujifilm and Medtronic, and has provided consultancy to Alpha-sigma Norgine, Olympus, Ambu, Boston Scientific, Covidien, and Takeda. H. Messmann has received research grants from Olympus and Satisfai, and lecture fees from Dr. Falk Pharma, Olympus, Norgine, IPSEN, Medupdate, and Erbe. Y. Mori has had loaned devices and received consultancy and speaker's fees from Olympus; he has an ownership interest in Cybernet System. P.D Siersema has received research support from Pentax, The E-Nose company, Lucid Diagnostics-US, Micro Tech, Motus GI, Magentiq Eye, Norgine, and Endo Tools Therapeutics, and consultancy fees from Motus GI and Magentiq Eye. M.F. Kaminski, T. Ponchon, and J. Zessner-Spitzenberg declare that they have no conflict of interest.

Funding

European Union and the Health and Digital Executive Agency | 101057099

References

[1] The European Parliament and the Council of the European Union. Regulation 2017/745 of the European parliament and of the Council on medical devices. Official Journal of the European Union 2017; L117: 1

[2] Bretthauer M, Gerke S, Hassan C et al. The new European Medical Device Regulation: balancing innovation and patient safety. Ann Intern Med 2023: doi:10.7326/M23-0454 [Epub ahead of print]

[3] European Commission. Public Health. Medical Devices Expert Panels. Accessed: 6 March 2023 https://health.ec.europa.eu/medical-devices-expert-panels/experts/expert-panels_en

[4] European Commission. Internal Market, Industry, Entrepreneurship and SMEs. Nando MDR database. Accessed: 6 March 2023 https://ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=directive.notifiedbody&dir_id=34

[5] MedTech Europe. MedTech Europe Survey Report analysing the availability of Medical Devices in 2022 in connection to the Medical Device Regulation (MDR) implementation. July 14, 2022. Accessed: 6 March 2023 www.medtecheurope.org/wp-content/uploads/2022/07/medtech-europe-survey-report-analysing-the-availability-of-medical-devices-in-2022-in-connection-to-the-medical-device-regulation-mdr-implementation.pdf

