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ADVERSE EVENT REPORTING IN THE EU AND THE USA: SIMILARITIES AND DIFFERENCES

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ADVERSE EVENT REPORTING IN THE EU AND THE USA: SIMILARITIES AND DIFFERENCES

In the European Union (EU), reporting of adverse events (also referred to as incident reporting) related to CE-marked medical devices is governed by the European Medical Devices Vigilance System (the System) established by the European Commission on the basis of the Medical Devices Directive (MDD)¹. The System includes mechanisms for the notification and evaluation of adverse events involving medical devices.

The aim of the System is to protect public health and the safety of EU citizens. The application of the System has also been extended to the European Free Trade Agreement (EFTA) countries, including, somewhat unusually, Switzerland which, while a member of EFTA is not a member of the European Economic Area (EEA). The main pillars of the System are monitoring, reporting, evaluation, dissemination of information and preventive and corrective measures. The System also includes a procedure concerning reporting of adverse events occurring in the clinical evaluation of medical devices prior to marketing.

In the USA, requirements for reporting of adverse events for marketed medical devices are provided by the Medical Device Reporting regulation (MDR) (Title 21 of the Code of Federal Regulations (21 CFR) Part 803). This Regulation was implemented by the Food and Drug Administration (FDA) under the authority of the *Federal Food, Drug and Cosmetic Act* (FFD&C Act).

The MDR provides a mechanism for manufacturers and medical facilities (known as user facilities) to report significant adverse events involving medical devices. It also provides a mechanism for manufacturers to report certain device malfunctions. In addition, the MDR requires manufacturers and user facilities to maintain files regarding reportable adverse events and procedures for determining whether or not adverse events are reportable. Investigational medical devices are exempted from the MDR and

adverse event reporting for these devices is covered under a separate FDA regulation (21 CFR Part 812).

The aim of the MDR is similar to that of the EU System: to protect public health and to help ensure that marketed medical devices are safe and effective for their intended use. Regulations for investigational devices also aim to ensure that these devices are studied in a manner consistent with public health and safety and with ethical standards.

EU Legal Framework

The legal base and regulatory guidance concerning adverse event reporting within the System and the reporting of adverse events experienced in the clinical evaluation of medical devices are found in the following legal acts and documents:

- Medical Devices Directive (Directive 93/42/EEC)¹;
- *In Vitro* Diagnostic (IVD) Medical Devices Directive (Directive 98/79/EC)²;
- Active Implantable Medical Devices (AIMD) Directive (Directive 90/385/EEC)³;
- *Guidelines on a medical devices vigilance system* (MEDDEV 2.12-1 rev 6, December 2009);
- *Guidelines on medical devices - Clinical evaluation: A guide for manufacturers and Notified Bodies* (MEDDEV 2.7.1 rev 3, December 2009);
- *Guidelines on Post Market Clinical Follow-up* (MEDDEV 2.12-2, May 2004).

Post-Marketing Medical Device Vigilance Legislation

Article 10 of the MDD requires EU Member States (MSs) to ensure that any information brought to their knowledge regarding incidents involving medical devices is recorded and evaluated centrally. Article 10 defines incidents as including

'any malfunction or deterioration in the characteristics and/or performance of a device, as well as any inadequacy in the labelling or the instructions for use which might lead to or might have led to the death of a patient or user or to a serious deterioration in his state of health'. The term incidents can also include the systematic recall of medical devices for any technical or medical reason.

In accordance with Article 10, where medical practitioners are required to report incidents to the national Competent Authorities (CAs) of EU MSs, related national rules should ensure that such incidents are also reported to the manufacturer of the device or his Authorised Representative.

Where, after assessment, the CAs of an EU MS take, or intend to take, measures to minimise the recurrence of the incidents, these should be notified, together with information regarding the incident, to the European Commission and the other MSs.

One aspect of the post-CE marking obligations related to medical devices laid down in the MDD⁴ is the obligation imposed on the device manufacturer to establish a systematic procedure to monitor and, where necessary, correct marketed medical devices. Where an incident (as defined by Article 10) occurs, the manufacturer of the device must immediately notify the CAs thereof.

Article 11 of the IVD Directive imposes obligations on manufacturers of IVDs that are very similar to those imposed by Article 10 of the MDD. However, the concept of an incident provided in Article 11 appears to be broader. The concept of an incident provided for in that Article adds failure of the device to the malfunction and deterioration provided for in Article 10 of the MDD. The link between the malfunction, failure or deterioration of the device and the death or serious deterioration of health that can result can be both direct and indirect. Furthermore, the definition of the person affected is not limited to the patient. It can also include the user of the device or any other person.

The provisions of Annex III to the IVD Directive governing obligations of the manufacturer arising from incidents reflect closely the relevant provisions of the Annexes

to the MDD discussed above.

Article 8 of the AIMD Directive closely reflects the provisions of Article 10 of the MDD. The same can be said of the provisions of the Annexes governing the related obligations of the manufacturer in relation to incidents⁵. These closely reflect the provisions of the Annexes to the MDD.

The MEDDEVs

The EU legislation governing medical devices does not include detailed guidance on the establishment and functioning of a vigilance system. It is the European Commission's MEDDEV 2.12-1 rev 6 that describes the European Medical Devices Vigilance System. It also provides examples of various types of adverse event, an interpretation of the provisions of the Directive discussed above and clear explanations of what should be reported, by whom, how, when and what further actions should be taken regarding incidents involving medical devices.

The Guidelines are divided into sections addressed to manufacturers, to national CAs, to Notified Bodies, to the European Commission and to users of medical devices. While they are not legally binding, in practice close compliance with the provisions of the Guidelines is strongly advised. The Guidelines also incorporate the provisions of the Global Harmonisation Task Force (GHTF) international regulatory guidance documents on vigilance and post-market surveillance.

In addition, the provisions of MEDDEV 2.12-2 provide guidance for manufacturers and Notified Bodies on how to fulfil obligations concerning compliance with the obligations relating to post-marketing clinical follow-up, which are contained in the Annexes to the MDD, the IVD Directive and the AIMD Directive discussed above.

The power of MS authorities to introduce safeguard measures is not affected by incident reporting obligations. Article 8 of the MDD, Article 8 of the IVD Directive and Article 7 of the AIMD Directive provide MS authorities with the power to take all appropriate interim measures to withdraw devices from the market or prohibit or restrict their placing on the market or putting into service, where it is ascertained that such

devices, even where they are correctly installed, maintained and used for their intended purpose, may compromise the health and/or safety of patients, users, other persons or the safety of property. This mechanism will not be discussed in detail as it falls outside the scope of this article.

Adverse Events Occurring During Pre-Marketing Clinical Evaluation of Medical Devices

Section 2.3.5 of Annex X to the MDD and Section 2.3.5 of Annex 7 to the AIMD Directive provide that all serious adverse events must be fully recorded and immediately notified to all CAs of the MSs in which the clinical investigation is being performed.

The provisions of MEDDEV 2.7.1 rev 3 define an adverse event as any untoward medical occurrence in a subject. A serious adverse event is defined as an event that: (i) led to a death; or (ii) led to a serious deterioration in the health of a patient, user, or others that (a) resulted in a life-threatening illness or injury; (b) resulted in a permanent impairment of a body structure or body function; (c) required in-patient hospitalisation or prolongation of existing hospitalisation; (d) resulted in medical or surgical intervention to prevent permanent impairment to body structure or a body function; or (e) led to foetal distress, foetal death or a congenital abnormality/birth defect.

US Legal Framework

The US legal framework is based on statutes enacted by the US Congress and federal regulations, which determine how statutes are implemented by federal agencies such as the FDA. Requirements for reporting adverse events for marketed medical devices are provided by the MDR (21 CFR Part 803). This Regulation was implemented by the FDA under the authority of Section 519 of the FFD&C Act, as amended by the *Safe Medical Devices Act of 1990*, the *Medical Device Amendments of 1992* and the *Food and Drug Administration Modernization Act of 1997*.

Guidance documents issued by the FDA are not enforceable as law but provide guidance on FDA's interpretation of the regulations.

Relevant FDA guidance documents regarding adverse event reporting include the following:

- *Medical Device Reporting: An Overview* (April 1996);
- *Medical Device Reporting for User Facilities* (April 1996); and
- *Medical Device Reporting for Manufacturers* (March 1997).

In addition, while investigational medical devices are exempted from the MDR, the implementing regulations for Investigational Device Exemptions (IDEs) (21 CFR Part 812) provide requirements for conducting clinical studies of investigational devices in humans. The IDE regulations include requirements for reporting certain adverse events to the FDA and to Institutional Review Boards (IRBs).

Post-Marketing Medical Device Vigilance

The MDR defines the types of adverse events and device malfunctions that must be reported, the entities that must report, the timeframe for reporting, and the entities to which the reports must be provided.

Under the MDR, manufacturers and user facilities must report significant adverse events involving medical devices. An adverse event is reportable if the manufacturer or user facility determines that the medical device may have caused or contributed to a death or serious injury. Based on the wording of the MDR, it may appear difficult to determine whether an adverse event rises to the level of reportability given that there may be no bright line test to establish whether the device 'may have caused or contributed' to the event. However, the FDA guidance, discussed further below, provides some recommendations for investigating adverse events and assistance in interpreting the standard for reportable adverse events. As in the EU, where doubt exists, the prudent course is to report the event.

In addition, under the MDR, manufacturers must report certain device malfunctions. A malfunction is reportable when it is likely to cause or contribute to a death or serious injury if it were to recur. Manufacturers must report such malfunctions regardless of the likelihood of a

recurrence of the malfunction because, for the purposes of reporting malfunctions, it is assumed that a malfunction will recur. However, whether a malfunction is 'likely' to cause or contribute to a death or serious injury is a standard that may be viewed as subject to interpretation; FDA guidance, discussed below, also provides manufacturers with some assistance in making this judgment.

The MDR requires manufacturers and user facilities to establish and maintain files for reportable adverse events. These files must include information about the event, and documentation of the decisions on whether to report and on the decision-making process. Furthermore, manufacturers and user facilities are also required to follow written procedures for reporting adverse events. These should include procedures for the timely and effective evaluation of events, for the review process by which determination is made as to whether events are reportable, and to assure the timely submission of complete reports.

Adverse Events Occurring During Pre-Marketing Clinical Evaluation of Medical Devices

Under the IDE regulation, adverse events that must be reported are those that are both serious and unexpected, known as Unanticipated Adverse Device Effects (UADEs). A UADE is defined, under 21 CFR Part 812.3(s), as:

'any serious adverse effect on health or safety or any life-threatening problem or death caused by, or associated with, a device, if that effect, problem or death was not previously identified in nature, severity, or degree of incidence in the investigational plan or application (including supplementary plan or application), or any other unanticipated serious problem associated with a device that relates to the rights, safety, or welfare of subjects'.

Thus, it is important for sponsors of clinical trials to prospectively identify those adverse events that are expected or anticipated to occur with clinical use of the device. These adverse events should be identified in the study protocol, informed consent and investigator manual.

Sponsors should identify not only the events themselves, but should also estimate the severity and incidence, where possible, as events that are identified as expected may still need to be reported if they are more severe than expected or occur more often than expected. As with MDR, when doubt exists as to whether an adverse event meets the requirements of a UADE, the prudent course for the study sponsor is to report the event as a UADE.

The IDE regulations, under 21 CFR Part 812.150, provide the timeframe for UADE reporting by clinical study investigators and sponsors. Investigators must report a UADE to the sponsor within 10 working days of first learning of it. The sponsor then must immediately conduct an investigation, and the result of the evaluation must be reported to the FDA, all reviewing IRBs, and participating study investigators, within 10 working days of first receiving notice of the UADE.

Further, if the sponsor determines that the UADE presents an unreasonable risk to subjects, the sponsor must terminate the investigation, not later than five working days after making this determination and not later than 15 working days after first receiving notice of the UADE.

Key Elements and Responsibilities under the EU Vigilance System

Who Should Report and What Should be Reported?

In accordance with the EU Medical Devices Vigilance System, incidents must be reported by the medical device manufacturer or his European Authorised Representative. MEDDEV 2.12-1 rev 6 defines 'incident' as 'any malfunction or deterioration in the characteristics and/or performance of a device, as well as any inadequacy in the labeling or the instructions for use which, directly or indirectly, might lead to or might have led to the death of a patient, or user or of other persons or to a serious deterioration in their state of health'.

In order for an event to constitute a reportable incident, i) such event should have occurred, ii) should have contributed to the incident as defined above, and iii) should have

led or might have led to death or serious deterioration of health.

Examples of events include malfunctions or deteriorations in the characteristics or performance of the device, unanticipated adverse reactions or unanticipated side effects, degradation and or destruction of the device, inaccuracies in the labelling, and instructions for use and/or promotional materials. The discovery of factors that could potentially lead or have led to an event could constitute a reportable event in itself.

In practice, the question is often how to determine whether an event is to be considered to constitute a reportable incident. As a general principle, when in doubt regarding the reportability of an event, manufacturers should have a pre-disposition to report events rather than not to. In complex situations where other factors are also involved, such as medicinal products or other medical devices, it is difficult to assess the link between the products. In such circumstances it is advised that the manufacturer assume that the device may have caused or contributed to the incident.

The consequences of an event should also be assessed. If the event has led or might have led to the death of a patient, user or other person or to a serious deterioration in the state of health of a patient, user or other person, such an event would constitute a reportable incident. Serious deterioration of health would include life-threatening illness, permanent impairment of a body function, permanent damage to a body structure, or a condition necessitating medical or surgical intervention to prevent such deteriorations.

The fact that an event has not led to death or serious deterioration of health due to the intervention of a healthcare professional or other circumstance does not exclude such an event from being considered a reportable incident. A determining factor in deciding whether an event should be reported in such circumstances is whether, if it occurred again, it may lead to death or serious deterioration in health.

Some events are not considered to constitute reportable incidents. These include deficiencies in a device that are found by the

user prior to its use, events caused by patient condition, expected and foreseeable side effects, and negligible likelihood of occurrence of death or serious deterioration in state of health. Moreover, use errors which have not led to death or serious deterioration of health need not be reported by the manufacturer. However, if the manufacturer notes a significant change in trend or in pattern of use errors that could potentially lead to death, serious deterioration in health or public health threat, such use errors become reportable.

It is important to note that the report of an incident by a manufacturer to a national CA does not constitute an admission of liability for the incident or its consequences on behalf of the manufacturer.

Manufacturers should also report to the CAs any field safety corrective actions (FSCAs).

There is no legal obligation on users to report incidents involving medical devices. However, CAs and manufacturers should encourage users and healthcare professionals to report incidents involving medical devices both to the manufacturer and to the MS CA.

Somewhat unusually for the EU, incidents that occur in a region outside the EEA or Switzerland and that have led to field safety corrective measures in such a region should be reported in the EU as field safety corrective measures.

It is important to note that, even where a device is no longer placed on the market, the reporting and vigilance obligations related to adverse events that are imposed on its manufacturer remain. This obligation is intended to address circumstances in which devices, although no longer actively marketed, still remain in use in a medical setting.

When, to Whom and How Should Reports be Made?

Manufacturers should report incidents to the CAs of the MS in which the incident took place and to the relevant Notified Bodies when such incidents may have an impact on the certification of the affected device.

FSCAs should be notified to the CAs of all affected MSs and to the CA responsible for the manufacturer or his Authorised Representative.

FSCAs should also be notified to affected users and customers by a field safety notice (FSN). The FSN should also be addressed to the Notified Body involved in the conformity assessment of the affected medical device.

Healthcare professionals and users are encouraged to report incidents to both the CAs and the manufacturers.

The manufacturer should report incidents presenting serious public health threats not later than two calendar days after awareness.

Where a manufacturer establishes a link between a device and the death or unanticipated serious deterioration in the state of health of the user, patient or any other person it must report not later than 10 calendar days following the date of awareness of the event.

Established links between any other incident and a device should be reported not later than 30 calendar days following the date of awareness of the event by the manufacturer.

An FSCA should be notified to the CAs before the FSCA is implemented and a draft of the FSN should be submitted for comments allowing for a minimum of 48 hours for the authorities to comment. This period could be shorter if there is an urgency to implement the FSCA.

Incidents should be reported by the manufacturer to the CA of the MS of occurrence of the incident by an initial incident report. Follow-up reports may be submitted where appropriate. A final report, which is the written statement of the outcome of the investigation and the adopted actions, should also be submitted where necessary.

Initial, follow-up and final reports may be submitted using the template enclosed in Annex 3 to MEDDEV 2.12-1 rev 6. There is some disagreement between MS authorities on this point, however, with some authorities refusing to accept a report in this format.

Key US MDR Definitions, Required Reports and Reporting Timelines

While the MDR and FDA guidance documents focus mostly on the reporting obligations of manufacturers and user facilities, it should be noted that importers also have reporting

responsibilities under the regulation.

Manufacturers are defined as those who manufacture devices by chemical, physical, biological or other procedures. Re-packagers/re-labellers, specification developers, and manufacturers of ready-to-use components or accessories all are considered manufacturers. Importers are defined as those who import a device into the US and further the marketing of the device from the original place of manufacture to the person who makes the final delivery or sale to the ultimate user. Importers do not change the packaging or labelling of the device; to do so makes the entity a manufacturer. Device user facilities include hospitals, ambulatory surgical facilities, nursing homes, and outpatient diagnostic or treatment facilities that are not physicians' offices. Outpatient treatment facilities are defined as entities that operate for the primary purpose of providing non-surgical therapeutic care. The definition includes ambulance providers, rescue services and home healthcare groups.

Manufacturers have the most extensive obligations in terms of reporting to the FDA. Manufacturers submit reports to the FDA of reportable deaths and serious injuries, and reportable malfunctions. Importers submit adverse event reports for deaths and serious injuries to the FDA and the manufacturer, and malfunction reports only to the manufacturer. User facilities submit reports of deaths to the FDA and the manufacturer, and reports of serious injuries only to the manufacturer. If the manufacturer is unknown, user facilities then submit reports of serious injuries to the FDA.

As mentioned above, reportable adverse events are deaths or serious injuries that may have been caused or contributed to by the medical device. A serious injury is defined, under 21 CFR Part 803.3, as an injury that:

- is life-threatening;
- results in permanent impairment of a body function or permanent damage to a body structure; *or*
- necessitates medical or surgical intervention to preclude permanent impairment of a body function or permanent damage to a body structure.

While the above definition may be, to an extent, subject to interpretation, it may be even more difficult to determine whether the device may have caused or contributed to the event. The MDR guidance document clarifies that a report is required when a reporting entity has information that reasonably suggests that a device may have caused or contributed to a death or serious injury. According to the guidance document, an event should be reported when there is a 'reasonable possibility that the device caused or contributed to the death or serious injury'. However, reporting entities should not assume 'unreasonable or unrealistic cause/effect relationships' between devices and events. On the other hand, the guidance adds that the reporting standard for 'may have' caused or contributed should not be construed as requiring 'absolute certainty' that an event was device related⁶.

For malfunctions, a manufacturer should report when there is information that reasonably suggests that the malfunction would be likely to cause or contribute to a death or serious injury were it to recur. 'Likely' in this context has been interpreted by the FDA to mean that the chance of death or serious injury occurring as a result of a recurrence of the malfunction is not remote.

Such information may be any professional, scientific or medical facts and observations or opinions. However, a report does not have to be submitted when there is information that would cause a person qualified to make a medical judgment to reach a reasonable conclusion that the device did not cause or contribute to a death or serious injury or that a malfunction would not cause or contribute to a death or serious injury if it were to recur.

Thus, it is important to ensure that there is appropriate medical/clinical input into the MDR decision-making process. It is also important to maintain documentation of the decision-making process, including documentation of all information evaluated in the course of the process.

Manufacturers and importers have 30 days from becoming aware to report MDR-reportable events. In addition, manufacturers must adhere to a more urgent timeline for events that require immediate remedial action. Such events must

be reported to the FDA within five work days. User facilities have 10 work days to submit reports to the FDA and/or the manufacturer. In addition, manufacturers (but not importers or user facilities) are required to submit supplemental reports within 30 days of becoming aware of new information that was not available when the initial report was filed.

Under a separate regulation, 21 CFR Part 806, manufacturers are also required to report certain voluntary field corrections or removals (both considered 'recalls') to the Agency. Recalls implemented to reduce a risk to health posed by the device, or undertaken because the device is in violation of FDA regulations, must be reported to the FDA.

It is important to note that under the MDR, all events that meet the definition of a reportable event must be reported, even if the event is a result of user error or off-label use. Moreover, all reportable deaths or serious injuries should be reported even if the event is within the frequency identified in the device labelling.

Further, manufacturers who market their devices in other countries should be aware that events that occur outside the US may need to be reported to the FDA under the MDR. A report should be filed if the same product, or a similar product involved in the event is marketed in the USA. The FDA interprets a similar device to include a device in the same device family as the subject device, or a device that could be marketed in the US under an existing pre-market clearance or approval. The FDA has issued warning letters to companies that failed to report such events occurring outside the USA.

Clinical Investigations

Serious Adverse Events Experienced in the EU

Serious adverse events experienced in clinical investigations should be notified by the sponsor of the clinical investigation. In most situations, the sponsor is the manufacturer of the medical device. The contract and all practical arrangements between the manufacturer and the investigator should ensure that the investigator notifies the sponsor immediately of serious adverse events occurring in the clinical investigation.

Serious adverse events occurring in a clinical investigation of a medical device should be immediately reported to all CAs of the MSs in which the clinical investigation is being performed.

Independently of the serious adverse events reporting examined above, at the end of the clinical investigations, along with the clinical evaluation report, manufacturers shall provide a summary of device-related adverse events, paying particular attention to serious adverse events.

In the USA

As discussed above, the US IDE regulations require that the investigator notify the sponsor and reviewing IRBs of any unanticipated adverse device effects that occur during clinical investigations, and also require that the sponsor submit reports of UADEs to the FDA and to reviewing IRBs. In addition, the sponsor reports other adverse events to the FDA in annual progress reports of the study that are required under the IDE regulation, and in the marketing application that the sponsor submits for FDA clearance or approval of the device.

Available Mechanisms for Exchange of Information

In the EU

The Medical Devices Directives contain specific provisions on the European databank for medical devices called EUDAMED (Article 14a of the MDD, Article 10b of the IVD Directive and Article 12 of the AIMD Directive).

The purpose of EUDAMED is to strengthen market surveillance and transparency of medical devices placed on the EU market. It provides CAs with access to information regarding manufacturers and Authorised Representatives, information on devices and certificates, and vigilance and clinical investigation data.

The database contains registration, certification, clinical investigation and vigilance information regarding medical devices placed on the EU market. It is not public and is accessible only to the MSs' CAs and the European Commission. Its use is currently voluntary but will become compulsory as of May 2011.

In the USA

The FDA has made adverse event reports regarding marketed medical devices submitted to the Agency available to the public. This information is available on-line in the Manufacturer and User Facility Device Experience (MAUDE) Database. The MAUDE database is searchable by product problem, product class, brand name, manufacturer, marketing clearance or approval number, and event type (death, serious injury or malfunction). The database is updated monthly.

NCAR Exchange Programme

The GHTF's National Competent Authority Reporting (NCAR) programme established an international mechanism for regulators in different countries to exchange voluntarily significant post-market information about medical device adverse events. Through the development of guidance documents, the GHTF (a voluntary group of representatives of national medical device regulatory authorities and trade associations of medical device manufacturers) set up a standard for a unified, worldwide system of reporting adverse events associated with medical devices. Key documents include:

- SG2-N54R8:2006, *Medical Devices Post Market Surveillance: Global Guidance for Adverse Event Reporting for Medical Devices*; and
- SG2-N79R11:2009, *Medical Devices: Post Market Surveillance: National Competent Authority Report Exchange Criteria and Report Form*.

Practical Implementation of the Systems and Comparison Between the EU and the USA

There is currently no quantitative or qualitative assessment of the functioning of the EU Medical Devices Vigilance System. Due to the absence of a centralised EU CA for medical devices and the potentially contradicting approaches by the MSs' CAs, the practical implementation of the System is somewhat obstructed by a relatively high number of players intervening and the potentially contradicting national law interpretations and procedures.

The implementation of the System involves 27 CAs and a larger number of Notified Bodies. One of the concerns often raised at EU level is the lack of uniformity of interpretation of the EU rules on medical devices by the CAs and the uneven level of administrative capacity and technical expertise of the Notified Bodies.

However, the relatively straight-forward legislative provisions, the detailed MEDDEV Guidelines and the tools provided by the EUDAMED database, mean that the System is relatively efficient and experiencing fewer interpretation conflict issues than other elements of the EU medical devices regulatory framework.

In the USA, the presence of the FDA (a federal agency with centralised authority over adverse event reporting) avoids the potential contradictions that may exist in Europe between EU-level and MS-level approaches. Despite the differences in the US and EU frameworks, the overall systems of adverse event reporting have many basic similarities. Both systems require the reporting of deaths and other significant adverse events that may be associated with medical devices. Both systems also require the reporting of certain device malfunctions that may lead to deaths or serious injuries. Moreover, the standards for reportable adverse events and malfunctions are similar in both jurisdictions. Both systems emphasise reporting requirements of manufacturers but provide for reporting of other entities involved in the sale and use of medical devices.

Given the significant comparability of US and EU adverse event reporting systems, it is not surprising that harmonisation efforts have begun. To date, as discussed above, harmonisation efforts have focused on sharing information among national regulatory authorities under the NCAR exchange programme. However, information shared under this programme is not

made publicly available. In the USA, but not in the EU, an on-line database that contains MDR-reportable adverse events and device malfunctions is publicly available. Although technological issues may need to be surmounted in creating an electronic database across jurisdictions, an expansion of harmonisation efforts to develop a searchable US/EU on-line database of reported device adverse events and malfunctions appears to be a reasonable goal. With the increasing globalisation in the marketing strategies of many medical device companies, such an approach would appear to hold many potential advantages for manufacturers, regulators and patients.

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