

Journal of Innovations in Applied Pharmaceutical Science (JIAPS)

ISSN:2455-5177



Technical documentation requirements for medical devices approval in European Union and a detailed emphasis on air-way products

Shanmukhi Kondrathi¹ and Ramaiah Maddi^{*2}

^{1,2}Department of Pharmaceutical Regulatory Affairs, Hindu College of Pharmacy, Amaravathi Road, Guntur – 522002, A.P., India

Article History

Receiced: 02-09-2021 Revised: 14-09-2021 Accepted: 16-10-2021



Keywords: Medical device, Technical documentation, Medical device Approval process, Air-way products.

Abstract

Content available at: www.saap.org.in

The technical documentation to be drawn up by the maker ought to be introduced in an unmistakable, coordinated, promptly accessible, and unambiguous way. It will remember for specific the components recorded as per Annex II of EU MDR 2017/745. The Air-Way is the way that air follows to get into and out of the lungs. There are a few kinds of Air-way devices are there on the lookout. New items will conceivably further develop patient prosperity altogether however will require sensible administrative control to boost the advantages. The orderly methodology is planned on a central theoretical level that underlies the substantial necessities that could be changed during the years to follow. The current article gives an itemized accentuation on Air-way items and their tech documentation necessities.

This article is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License. Copyright © 2021 Author(s) retain the copyright of this article.



*Corresponding Author Ramaiah Maddi

E-mail: rampharma83@gmail.com



https://doi.org/10.37022/jiaps.v6i3.244

Production and Hosted by www.saap.org.in

Introduction

1.1 European Union

The European Union (EU) is a political and financial association, comprising of 27 part expresses that are dependent upon the commitments and the advantages of the participation. Each part state is essential for the establishing deals of the association and is exposed to restricting laws inside the normal authoritative and legal organizations. All together for the EU to take on strategies that worry safeguard and international concerns, all part states should concur consistently [1]. European Union are advance harmony, its qualities and the prosperity of its residents, offer opportunity, security and equity without inward boundaries, feasible improvement dependent on adjusted financial development and value strength, an exceptionally

Journal of Innovations in Applied Pharmaceutical Science

aggressive market economy with full business and social advancement, and natural assurance, battle social avoidance separation, advance logical and mechanical advancement, upgrade monetary, social and regional attachment and fortitude among EU nations, regard its rich social and phonetic variety, build up a financial and money related association whose cash is the euro. The EU is focused on aiding casualties of man-made and cataclysmic events worldwide and upholds more than 120 million individuals every year. By and large, the EU and its constituent nations are the world's driving, Each EU nation is interesting. This implies that total national output (GDP) and populace development for instance can be altogether different starting with one country then onto the next. Every nation likewise has its own way to deal with key strategy regions like instruction. Training expands the abilities of the labor force and places them in a superior situation to adapt to expanding worldwide rivalry. The measure of cash every nation spends on schooling changes [2].

1.2 Medical device

As per Article 2,'Medical device' means any instrument, apparatus, appliance, software, implant, reagent, material, or other article intended by the manufacturer to be used, alone

or in combination, for human beings for one or more of the following specific medical purposes: 1. diagnosis, prevention, monitoring, prediction, prognosis, treatment or alleviation of disease, 2. diagnosis, monitoring, treatment, alleviation of, or compensation for, an injury or disability, investigation, replacement or modification of the anatomy or of a physiological or pathological process or state, 3. Providing information by means of in vitro examination of specimens derived from the human body, including organ, blood, and tissue donations. Medical devices are exceptionally wide-going items, like device/instruments, programming, and materials (for example substances). Different definitions for the expression 'medical device' exist together as indicated by guidelines in the European Union (EU), Overall, the term refers to comparable or related. Within these definitions and despite minor contrasts the expressing with respect to the 'essential planned activity' of a medical device is at present liable for the expanding number of items that are in the borderline among devices and drugs [3].

1.3 Classification as per EU MDR

Class I: This route is self-assertion or self-certificate and is stated in Annex VII Module A, EC Declaration of Conformity. The producer guarantees and officially proclaims, through a composed assertion, that the items meet the appropriate arrangements of the Directive.

Class IIa: The producer proclaims similarity with the arrangements of the Directive and Regulations (Annex VII) and guarantees that the items follow pertinent fundamental necessities. In any case, for Class IIa items, this presentation should be upheld in all cases with similarity appraisal by a NB utilizing Annex II, IV, V or VI.

Class IIb: Manufacturers of Class IIb Medical devices may also choose the full quality confirmation route (Annex II) including appraisal by a NB of the technical documentation for at least one representative sample for each generic device group for compliance with the Directive Medical device with the Directive (Annex II area 7).

Class III: This route is to conform is like those for Class IIb medical devices however also requires the maker to submit the dossier to the NB for approval under review of the full quality confirmation framework (Annex II) and don't permit the Annex VI choice. Active implantable medical devices (AIMD) and in vitro diagnostic medical devices (IVD) are likewise dependent upon conformity techniques [4].

2. Guidelines of Medical devices in the European Union

To ensure medical devices' quality and safety, the European Union (EU) has released a new Medical Device Regulation (MDR) in May 2017. Initially, there was a transition period of 3 years to implement the new EU MDR 2017/745. Accordingly, most of the articles of the regulation should be enforced The EMA (European Medical Agency) is

responsible for evaluating the quality, safety, and efficacy of marketing authorization applications assessed through the centralized procedure, counting the safety and execution of the medical device regarding its utilization with the medicinal product. The EU body system guarantees the prosperity and adequacy of medical device and works with patients' access to the devices within the European market. To secure general welfare and guarantee security for European residents within the clinical innovation trade specialists launched enactments for the business to follow, even as rules and tips to figure with authorities. on these lines, medical device suppliers, wholesalers and producers so forth operating within the EU ought to meet a number of conditions to enter and stay accessible

2.1EU declaration of conformity

As per Article 19 Annex IV of EU MDR 2017/745.

a. The EU declaration of conformity shall state that the requirements specified in this Regulation have been fulfilled in relation to the device that is covered. The manufacturer shall continuously update the EU declaration of conformity. The EU declaration of conformity shall, as a minimum, contain the information set out in Annex IV and shall be translated into an official Union language or languages required by the Member State(s) in which the device is made available.

b. Where, concerning aspects not covered by this Regulation, devices are subject to other Union legislation which also requires an EU declaration of conformity by the manufacturer that fulfilment of the requirements of that legislation has been demonstrated, a single EU declaration of conformity shall be drawn up in respect of all Union acts applicable to the device. The declaration shall contain all the information required for identification of the Union legislation to which the declaration relates.

c. By drawing up the EU declaration of conformity, the manufacturer shall assume responsibility for compliance with the requirements of this Regulation and all other Union legislation applicable to the device.

The Commission is empowered to adopt delegated acts in accordance with Article 115 amending the minimum content of the EU declaration of conformity set out in Annex IV in the light of technical progress.

CE marking of conformity as per Article 20 of EU MDR 2017/745 Devices, other than custom-made or investigational devices, considered to be in conformity with the requirements of this Regulation shall bear the CE marking of conformity, as presented in Annex V.

The CE marking shall be subject to the general principles set out in Article 30 of Regulation (EC) No 765/2008. At the end of the CE marking process the manufacturer confirms the CE marking compliance of the product by drawing up a EU Declaration of Conformity (or 'Declaration of Conformity' or

'DoC') and affixing the CE marking. Basically, the DoC is a one-page document in which the manufacturer specifies which EU CE marking directives and standards his product complies with. The EU Declaration of Conformity must be issued before the product is placed on the market in Europe [5] For products that may already have FDA or EU (CE mark) approval, an independent approval process has been established in South America. A Free Sale Certificate (FSC) or a Certificate to Foreign Government (CFG) obtained from the country of origin confirms that a product is approved for sale there. These certificates include a product description with specific product numbers and identify the manufacturing site. They can enable medical devices to be exported to South America without restriction [6].

3. Technical Documentation

As per article Annex II of EU MDR 2017/745 Claims The technical documentation and, if applicable, the summary thereof to be drawn up by the manufacturer shall be presented in a clear, organised, readily searchable and unambiguous manner and shall include in particular the elements listed in this Annex.

- Device Description and Specification, Including Variants and Accessories
- 2. Information to Be Supplied by The Manufacturer
- 3. Design and Manufacturing Information
- 4. General Safety and Performance Requirements
- 5. Benefit-Risk Analysis and Risk Management
- 6. Product Verification and Validation
- 1.1. Device description and specification
- (a) product or trade name and a general description of the device including its intended purpose and intended users;
- (b) the Basic UDI-DI as referred to in Part C of Annex VI assigned by the manufacturer to the device in question, as soon as identification of this device becomes based on a UDI system, or otherwise a clear identification by means of product code, catalogue number or other unambiguous reference allowing traceability;
- (c) the intended patient population and medical conditions to be diagnosed, treated and/or monitored and other considerations such as patient selection criteria, indications, contra-indications, warnings;
- (d) principles of operation of the device and its mode of action, scientifically demonstrated if necessary; (e) the rationale for the qualification of the product as a device;
- (f) the risk class of the device and the justification for the classification rule(s) applied in accordance with Annex VIII;
- (g) an explanation of any novel features;
- (h) a description of the accessories for a device, other devices and other products that are not devices, which are intended to be used in combination with it;

- a description or complete list of the various configurations/variants of the device that are intended to be made available on the market;
- (j) a general description of the key functional elements, e.g., its parts/components (including software if appropriate), its formulation, its composition, its functionality and, where relevant, its qualitative and quantitative composition. Where appropriate, this shall include labelled pictorial representations (e.g., diagrams, photographs, and drawings), clearly indicating key parts/components, including sufficient explanation to understand the drawings and diagrams; (k) a description of the raw materials incorporated into key functional elements and those making either direct contact with the human body or indirect contact with the body, e.g., during extracorporeal circulation of body fluids;
- (l) technical specifications, such as features, dimensions and performance attributes, of the device and any variants/configurations and accessories that would typically appear in the product specification made available to the user, for example in brochures, catalogues and similar publications
- 2. Information to Be Supplied by The Manufacturer

A complete set of: the label or labels on the device and on its packaging, such as single unit packaging, sales packaging, transport packaging in case of specific management conditions, in the languages accepted in the Member States where the device is envisaged to be sold; and the instructions for use in the languages accepted in the Member States where the device is envisaged to be sold.

- 3. Design and Manufacturing Information
- (a) information to allow the design stages applied to the device to be understood;
- (b) complete information and specifications, including the manufacturing processes and their validation, their adjuvants, the continuous monitoring and the final product testing. Data shall be fully included in the technical documentation;
- (c) identification of all sites, including suppliers and subcontractors, where design and manufacturing activities are performed.
- 4. General Safety and Performance Requirements

The documentation will contain data for the exhibit of similarity with the overall wellbeing and execution necessities set out in Annex I that are material to the medical device considering its expected reason, and will incorporate a support, approval and check of the arrangements took on to meet those requirements. The showing of similarity will incorporate:

(a) the general safety and performance requirements that apply to the device and an explanation as to why others do not apply;

- (b) the method or methods used to demonstrate conformity with each applicable general safety and performance requirement;
- 5. Benefit-Risk Analysis and Risk Management The documentation shall contain information on:
- (a) the benefit-risk analysis referred to in Sections 1 and 8 of Annex I, and $\,$
- (b) the solutions adopted and the results of the risk management referred to in Section 3 of Annex I.
- 6. Product Verification and Validation

The documentation will contain the outcomes and basic examinations, everything being equal, and approval tests or potentially studies embraced to exhibit similarity of the gadget with the necessities of this Regulation and specifically the relevant general security and execution requirements

Technical Documentation on Post-Market Surveillance as Per Annex III

The technical documentation on post-market surveillance to be drawn up by the manufacturer in accordance with Articles 83 to 86 shall be presented in a clear, organised, readily searchable and unambiguous manner and shall include in particular the elements described in this Annex.

- 1. The post-market surveillance plan drawn up in accordance with Article 84. The manufacturer shall prove in a post-market surveillance plan that it complies with the obligation referred to in Article 83.
- (a) The post-market surveillance plan shall address the collection and utilization of available information, in particular: information concerning serious incidents, including information from PSURs, and field safety corrective actions; records referring to non-serious incidents and data on any undesirable side-effects; information from trend reporting; relevant specialist or technical literature, databases and/or registers; information, including feedbacks and complaints, provided by users, distributors and importers; and publicly available information about similar medical devices. (b) The post-market surveillance plan shall cover at least a proactive and systematic process [7].



Figure 1: Structure of EU MDR Technical documentation **4.Air-Way Products**

Air- Way is the path that air follows to get into and out of the lungs. The mouth and nose are the normal entry and exit ports for the airway. Entering air then passes through the back of the throat (pharynx) and continues through the voice Journal of Innovations in Applied Pharmaceutical Science box (larynx), down the trachea, to finally pass through the bronchi. Air –way products come under the rule 21 as per MDR chapter 2 [8].

4.1 Types of Air- way devices

- a) Tracheal Intubation.
- b) Laryngoscopy.
- c) Laryngeal Mask Airway.
- d) Combitube
- e) Air-way management
- f) Resuscitation [9]

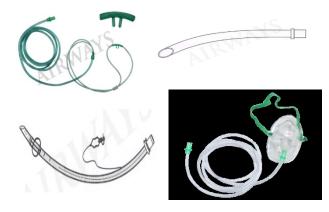


Figure 2: Types of Air-way devices

4.2 Classification of airway devices

- a) Nasopharyngeal Air-way devices
- b) Oropharyngeal Air-way devices
- c) Supraglottic Air-way devices
- d) Tracheostomy Air-way devices
- e) Extraglottic Air-way devices
- f) Laryngeal Air-way devices

5. Approval Process of Medical device in EU as per EU MDR

Stage 1

The manufacturer, in getting ready for CE marking, should initially decide whether their item falls inside the extent of an important Directive either as a medical device or as an accomplice to a medical device. Meanings of what comprises a medical device will be characterized in the significant order.

Stage 2

Having affirmed that the item is dependent upon a European Medical Device Directive, affirm which mandate explicitly applies, likewise affirm if the guidelines consider the to be device as an item inside its own right, or as an assistant to a connected medical device. Distinguish other European Directives which might be affecting on the item. For instance, assuming the medical device has a functioning force source, the AIMD Directive (Active Implantable Medical Devices Directive) may apply, not withstanding, similarly the clinical gadget might need to follow Directive 2004/108/EC which identifies with electromagnetic similarity.

Stage 3

Determining the level of risk

General medical devices and related accessories must be classified into one of four classes, The classification of a device determines the conformity assessment options that are applicable to the device, with higher risk devices undergoing higher levels

4 classes as follows

Class I – low risk

Class IIa - medium risk

Class IIb - medium risk

Class III - high risk

Duration of contact: In deciding the right arrangement of a medical device, the length that the device is in consistent contact with the patient is characterized as transient, present moment. The more extended the device is in touch with the patient, the more prominent the possible danger, and in this manner contact term should be considered while deciding characterization. Persistent use is characterized in MEDDEV 2.4/1 as the continuous real use for the planned reason. Where utilization of a device is suspended all together that the gadget is quickly supplanted with an indistinguishable device (e.g., substitution of a urethral catheter) this will be considered as constant utilization of the device. Span of contact can be troublesome in certain cases to decide. For instance, if a device requires a cream or balm is applied to the body, the term of impact of the cream or treatment might be considered as a factor while deciding the length

Degree of invasiveness

A medical device, which in entire or to some extent, enters inside the body either through a body opening or through the skin surface, is invasive. Intrusiveness is for the most part classified as obtrusive of a body opening (counting the outer layer of the eye), carefully obtrusive devices and implantable devices. An implantable device is one which is planned to be completely brought into the human body or to supplant an epithelial surface or the outer layer of the eye by careful mediation, any device expected to be to some extent brought into the human body through careful intercession and planned to stay set up after the methodology for no less than 30 days is additionally viewed as an implantable device. The device dynamic or non-dynamic A medical device is viewed as dynamic if activity of the device relies upon a wellspring of electrical energy or any wellspring of force other than that straightforwardly created by the human body or gravity and which acts by changing over this energy. medical devices expected exclusively communicate energy between a functioning medical device and the patient where there is no huge change in the energy (for example nature, thickness, level) are not viewed as dynamic medical device. The idea 'act by changing over energy' remembers transformation of energy for the devices

and additionally transformation at the interface between the device and the tissues or in the tissues of the human body. Some portion of the body influenced. The life structures influenced by the utilization of the device should be thought of

Stage 4

Technical File, Design Dossier

The device developer and producer should keep a Design File (Design Dossier) and continuous Technical File which gives proof of adjustment to the fundamental necessities of the important Medical Device Directive. peer item audit information should be accessible to guarantee the powerful working of the devices. The Technical File is a prerequisite for class I, IIa, IIb devices. The Design Dossier is a prerequisite of class III devices. The Technical File will give data

Stage 5

Quality Management system

The product manufacturing process should agree with essential quality administration framework necessities. For most of medical device makers this will require consistence with the ISO 13485 standard. In particular, consistence with the standard will be requested for items which live inside the IIa, IIb, and III degrees of hazard, not withstanding class I items with a sterile viewpoint or an estimation work. Class I devices need a lower level of value framework components, but consistence with all parts of the ISO 13485 standard could be viewed as great business practice in any event, for Class I medical devices. Accreditation to the ISO 13485 standard will require outsider Notified Body confirmation and on-going observation evaluating

Stage 6

Labelling

Every European nation might require naming to be in their authority language.

Stage 7

Registration

The following devices classes should be enlisted with the Competent Authority where the maker or their Authorized Representative is found. Most EU nations don't need enrollment for class IIa, class IIb, or Class III devices as these will require. All class I devices which might have been revamped or re-named under another name.

All framework or strategy packs containing something like one medical device. Uniquely designed medical device. All in vitro medical device. in vitro diagnostic medical devices (IVDs) going through performance evaluation.

Stage 8

Declaration of Conformity

The EC declaration of conformity is a written document which states that the manufacturer of a medical device has

Shanmukhi et al,. J. innov. appl. pharm. Sci, 6(3) 2021, 48-53

complied with all relevant EU requirements relevant to the device i.e., completed the medical device approval process.

The declaration may cover a single device or multiple devices, all of which will be clearly identified on the declaration via product name, product model, etc. Also detailed where relevant will be the applicable directives, the EU Authorized Representative (where the manufacturer is not based in the EU), Notified Body engaged for audit and technical files review, key standards applied in meeting the requirements.

Stage 9

Post market surveillance

All medical devices put onto the European market should be dependent upon a fitting post market reconnaissance measure. A medical device producer needs to have a favorable to dynamic observation framework set up, which will incorporate checking client criticism, distinguishing researching and tending to objections, grumbling moving, the execution of a successful and effective remedial and deterrent activity measure, for more significant level risk devices support of a data set which joins devices to clients, upkeep of records which will permit forward and invert following of fabricated devices, for example on the off chance that an issue is distinguished for instance with an unrefined substance after devices have been fabricated, then, at that point, the producer should have the option to recognize influenced devices in the field, then again assuming a shortcoming is related to a devices in the field, the maker should have the option to follow back to assembling information. The higher risk devices will require more exhaustive following records and cycles.

Stage 10

Medical device approval affixing the CE label

Where all pertinent order prerequisites have been met (i.e., medical device approval,), the Notified Body if material has affirmed that the quality framework, specialized record, plan documents are all to assumptions, product names meet individual nation necessities, a market reconnaissance framework is set up, then, at that point, the CE label can be attached to the product and the device put onto the European market. Where the producer is situated external the EU, an Authorized Representative should have been named [10].

Conclusion

Medical devices marketing in Europe is very potential and also very gained market in the Europe for approval of medical devices. The technical documentation as per the specifications EU MDR 2017/745, the air-way products are very much important now-a-days, so those who are going to manufacture's the air-way products they have to follow the

proper technical documentation guidelines while submitting their dossier.

References

- 1. The European union and countries in the EU[online] Available at: https://www.schengenvisainfo.com/eu-countries/[Accessed 8 October 2021].
- European Union. 2021. The EU in brief | European Union. [online] Available at: [Accessed 3 October 2021].">https://european.eu/European Union/about-eu/eu-in-brief_en>
- Marco Racchi, Stefano Govoni, Adele Lucchelli, Laura Capone & Emiliano Giovagnoni (2016) Insights into the definition of terms in European medical device regulation, Expert Review of Medical Devices, 13:10, 907-
 - 917, DOI: <u>10.1080/17434440.2016.1224644</u>.[Accessed 3 October 2021].
- 4. French-Mowat E, Burnett J. How are medical devices regulated in the European Union. JR Soc *Med.* 2012;105 Suppl 1(Suppl 1):S22-S28. doi:10.1258/jrsm.2012.120036 [Accessed 8 October 2021].
- 5. MDR 2017/745 New EU Regulation for Medical Devices (online). Available at: http://kth.diva-portal.org/smash/get/diva2:1458462/FULLTEXT01.p df>[Accessed 3 October 2021].
- Lamph S. Regulation of medical devices outside the European Union. Journal of the Royal Society of Medicine. 2012;105(1_suppl):12-21. [Accessed 8 October 2021]
- 7. Eur-lex.europa.eu.2021.EUR-Lex-02017R0745-20170505-EN-EURLex.https://eur-lex.europa.eu/eli/reg/2017/745/2017-05-05 [online]

 Available at: [Accessed 3 October 2021].
- 8. Melissa Conrad Stöppler, MD., Reviewed on 3/29/2021., Available at: https://www.medicinenet.com/airway/definition.htm>. [Accessed 3 October 2021].
- Air-way[online] Available at: https://www.sciencedirect.com/topics/medicine-and-dentistry/airway-device[Accessed 3 October 2021].
- 10. Medical Device Approval. European Regulatory Process (online). Available at: https://www.presentationeze.com/presentations/m edical-device-validation/medical-device-validation-full-details/european-medical-device-regulatory-approval-process> [Accessed 3 October 2021].