

REGULATION ON MEDICAL DEVICES IN DIFFERENT COUNTRIES

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Abstract: It is important to understand regulations on medical devices because the development and the implementation of medical devices depend a lot on the current regulations. In this paper regulations on medical devices outside the European Union and in the European Union are discussed. Premarket regulations and classification of medical devices in the USA are presented. A question whether food and drug administration considers mobile medical applications to be medical devices is addressed. The main documents that are necessary to receive the registration license in Russia and the Notified Bodies in Russia are described. Moreover, three European Directives related to medical device regulations are presented.

Introduction

Medical devices are used in all branches of medicine, surgery and community care to treat and diagnose diseases. Although the medical device industry is fairly large, intensely competitive and highly innovative, the formal regulation of medical devices in the European Community only began in the mid-1990s. But nowadays it is obvious that having an understanding of medical device regulation is an important requirement for doctors and healthcare professionals alike.

The possible costs for development of a medical device often influence the manufacturer's decision about pursuing new devices. Regulatory requirements play an important role in this decision because they can escalate these costs. But if these requirements are too strict, new product will not be developed. On the other hand, problems related to medical devices have serious consequences for consumers [1]. Defects in medical devices can be dangerous for patients.

Regulations on Medical Devices outside the European Union

It is important to compare, how medical device industries regulated in different countries.

The USA is one of the biggest healthcare markets. One analysis found that "32 of the 46 medical technology companies with more than \$1 billion in annual revenue are based in the United States" [2]. Russia is a representative of non-European countries and also a growing healthcare market. It is suggested to research regulation on medical devices that are used in these countries.

US Regulatory Framework

Food and Drug Administration (**FDA**) is responsible for regulating medical devices in the United States. This agency is a part of the Department of Health and Human Services (**HHS**). To be legally placed on the American market every medical must be approved by FDA. FDA's Center for Devices and Radiological Health (**CDRH**) reviews medical devices. Center for Biologics Evaluation and Research (**CBER**) regulates devices associated with blood collection and processing procedures, cellular products and tissues [1].

The process of medical device legalizing can be divided into two parts –premarket and post-market regulations.

Premarket regulations. As in Europe, in the USA there is a procedure of the medical device classification. Medical devices are classified according to the risk they pose to consumers and are divided into Class I, II, and III. Regulatory control increases from Class I to Class III. Most Class I devices (low-risk devices) are exempt from Premarket Notification 510(k); most Class II devices require Premarket Notification 510(k); and most Class III devices require Premarket Approval. Premarket approval application (**PMA**) includes clinical studies that should prove that the medical device is safe and effective. Approval is usually necessary for high-risk devices. The process of receiving this document is lengthy and expensive. When there is PMA application, FDA approved the device. Another path that manufacturers can use to bring their moderate- and high-risk devices to market with FDA's permission path involves submitting a 510(k) notification. Notification 510(k) demonstrates that the device is substantially equivalent to a device already on the market (a predicate device) that does not require a PMA. The performance characteristics of the both devices are compared. To be considered substantially equivalent, the new device must have the same intended use and technological characteristics as the predicate; clinical data demonstrating safety and effectiveness are usually not required [1]. Although the manufacture selects predicate device to compare with its new device, FDA has the right to define whether a comparison is appropriate. The 510(k) process is unique to medical devices and results in FDA clearance [1].

The FDA decision (Premarket approval or 510(k) clearance) depends on the information that is submitted by the manufacturer. The required information depends on the class of medical device and its risk.

Classification of medical devices is an important procedure to bring the device to the market. Classes and necessary approval procedures for the medical devices are presented in the table below.

Legal procedures for different classes of medical devices in USA

Class	Risk	Necessary procedures for the medical device marketing
I	Low-risk devices	Registration 510(k) clearance may be required
II	Moderate-risk devices	510(k) clearance Investigational device exemption is possible
III	High-risk devices	Premarket approval application 510(k) clearance Investigational device exemption is probable

The FDA decision (Premarket approval or 510(k) clearance) depends on the information that is submitted by the manufacturer. The needed information depends on the class of medical device and its risk. Premarket approval or 510(k) clearance is following.

Premarket approvals generally require some clinical data prior to gaining approval [1]. An investigational device exemption (**IDE**) allows the investigational device to be used in a clinical study in order to collect safety and effectiveness data required to support a Premarket Approval (**PMA**) application or a Premarket Notification 510(k) submission to FDA [3].

A PMA must contain (among other things) the following information:

- summaries of non-clinical and clinical data supporting the intended use and performance characteristics;
- detailed information on the device design and device components;
- instructions for use;
- representations of packaging and labeling;
- a description of means by which users can assess the quality of the device;
- information about computer software or additional or special equipment;
- literature about the disease and the similar devices; and,
- information on the manufacturing process.

Approval is based not only on the strength of the scientific data, but also on inspection of the manufacturing facility to assure that the facility and the manufacturing process are in compliance with the quality systems regulations (**QSR**) [4].

FDA may take any of the following actions on a 510(k) after conducting its review:

- find the device substantially equivalent to the predicate and issue a clearance letter;
- find the device not substantially equivalent (**NSE**) and issue an NSE letter prohibiting marketing;
- determine that the device is exempt from a 510(k) submission;
- request additional information (with the final clearance decision pending review of that information).

Post-market regulations. Post-market requirements include the following:

- Labelling,
- Manufacturing,
- Post-marketing surveillance,
- Adverse event reporting.

FDA and mobile medical applications. In September 2013 Mobile Medical Applications Guidance for Industry and Food and Drug Administration Staff was issued. The overall aim of this document is to clarify the subset of mobile apps to which the FDA intends to apply its authority [5]. According to the document, “a mobile application or “mobile app” is defined as a software application that can be executed (run) on a mobile platform (i.e., a handheld commercial off-the-shelf computing platform, with or without wireless connectivity), or a web-based software application that is tailored to a mobile platform but is executed on a server”. Mobile medical app is also intended to be used as an accessory to a regulated medical device or to transform a mobile platform into a regulated medical device.

The FDA will apply the same risk-based approach the agency uses to assure safety and effectiveness for other medical devices [6]. The guidance document provides examples of how the FDA might regulate certain moderate-risk (Class II) and high-risk (Class III) mobile medical apps [6]. The document also describes the cases when mobile apps are not considered to be medical devices.

According to the guideline, FDA will regulate mobile apps that perform the same functions as traditional medical devices.

Russia Regulatory Framework

Approval of Medical Devices is mandatory in the Russian Federation. Manufacturers or distributors must obtain registration for their Medical Devices before they can place them on the Russian market [7].

Although Russian healthcare market is considered to be among the top 20 in world, the registration process is challenging [7].

There are three main regulatory authorities in Russia:

1. *Roszdravnadzor*. In Russia all medical devices must be registered in Moscow, at the central department of the Federal Service for Control of Healthcare and Social Development in the Russian Federation. It governs and controls the registration procedure, approves or rejects applications for state registration, and works to ensure clinical safety and efficiency of medical devices and medical equipment.

2. *Gosstandart*. Known as the Federal Agency for Technical Regulation and Metrology, this agency makes sure that medical equipment imported into Russia meets established Russian standards. This agency is responsible for GOST-R certification.

3. *Rospotrebnadzor*. This is the Federal Service for Supervision in the Area of Consumer Rights and Welfare Protection. This agency makes sure that products meet Russia's sanitary and epidemiological regulations for products that come into contact with the human body or which may otherwise negatively affect patients or doctors.

It should be mentioned in Russia there are different regulations to market medical devices produced in Russia and produced abroad.

Regulations for medical devices produced outside Russia. The main document that is needed to market a medical device in Russia is **Registration Certificate** of Rospoterbnadzor (Federal Service for Control of Healthcare and Social Development in the Russian Federation). Registration Certificate for a medical device confirms that this medical device is registered in Russia. The certificate indicates the name of the producer, the name of the device, the intended use and the class of the potential risk to the patient.

The following documents are necessary to receive Registration license:

1. Application for registration.
2. Medical Device information sheet.
3. Extract from the commercial register (company registration certificate).
4. Certificate as per ISO 13485.
5. Declaration of conformity in accordance with 93/42/EEC, 98/79/EC, 90/385/EEC.
6. Design specifications.
7. Instructions for use.
8. Technical test records.

The procedure of applying for the Registration Certificate is following. The dealer applies for the Registration Certificate and the producer prepares documents that are important for the registration. It is worth noting that all the documents must be in Russian or officially translated into the Russian language. As soon as application is sent, the medical device must be tested. If the tests confirm that the medical device is safe and effective, it can be registered in Russia.

Another important document for the legalisation is **GOST-R Certificate of Conformity**. GOST-R Certificate of Conformity can only be issued if the Registration license has already been signed. This document signifies that the medical device complies with Russian standards, quality and safety requirements. The GOST-R Certificate is used for customer clearance in Russia, for sales and marketing within the country.

Although Registration Certificate of Rospoterbnadzor and GOST-R Certificate of Conformity are the most important documents to market a medical device in Russia, there are also some other documents that must be issued in Russia. and comply with

Russian standards, quality and safety requirements. For example, Hygiene Certificate or Metrological Certificate.

Regulations for medical devices produced in Russia. Document that describes **technical conditions** during the production is the most important document that allows to market medical devices produced in Russia. Medical devices and its documentation are tested by Federal Service for Control of Healthcare and Social Development in the Russian Federation. If the tests confirm that the medical device comply with the standards, quality and safety requirements, this medical device can be used in Russia. As soon as the described document is issued, the manufacturer can apply for the **Registration Certificate**.

Production licence allows serial production of the medical device in Russia. Manufacturer can apply for the production licence only when document that describes the technical conditions during the production and Registration Certificate have been issued.

Moreover, there are additional documents to market the medical device in Russia. These regulations are the same as for medical devices produces outside Russia.

Regulation of medical devices in Russia can be improved in order to make the process easier. The registration and testing process in Russia is complicated and burdensome with many entities involved [7]. To be successful in the field it is important to have an experienced local consultant or regulatory expert that has established relationships with government officials and understands Russian business culture.

EU Regulatory Framework

In Europe there are various organizations and committees dealing with regulations of medical devices in Europe. However, major players include only two organizations the European Commission and Notified Bodies (fox example, BSI or TUV).

A regulatory system for medical device regulation is used in the European Union. Collectively known as the Medical Device Directive (**MDD**), this core legal framework consists of three directives that regulate the safety and marketing of medical devices in Europe.

There are three European Directives related to device regulations:

- Active Implantable Medical Device Directive (AIMDD 90/385/EE);
- Medical Device Directive (MDD 93/42/EEC);
- In Vitro Diagnostic Medical Device Directive (IVDMDD 98/79/EC).

These Directives were introduced in the 1990s and have been updated several times since then. In this report we will constantly refer to the Medical Device Directive. These Directives state that only products fulfilling the essential requirements may be placed on the market. The application of harmonized standards or their specification remains voluntary and manufactures are free to choose any technical solution that provides compliance with the essential requirements.

Additional directives include directives that deal with public procurement, general product safety, electromagnetic compatibility, information technology equipment etc.

Conclusion

It worth noting that existing EU rules – dating back to the 1990s – have not kept pace with the enormous technological and scientific progress in the past 20 years [7]. Moreover, EU countries interpret and implement the current rules in different ways [8]. The need for greater transparency and the fact that it is not always possible to trace medical devices back to their supplier encouraged the authorities to review the current regulations on medical devices.

Not only in Europe but also in Russia regulations on medical devices are being changed. It is very important not only for doctors but also for healthcare professionals to follow these changes because the regulations on medical devices can affect every day job in the hospital.

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Требования, предъявляемые к медицинским изделиям в разных странах

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Ключевые слова и фразы: европейские директивы; медицинское оборудование; нотифицированные органы по сертификации продукции; правила; управление по санитарному надзору за качеством пищевых продуктов и медикаментов.

Аннотация: Правила и нормативы, регулирующие оборот медицинской техники, важны, так как напрямую влияют на разработку и дальнейшую продажу медицинской техники. Рассмотрена нормативная документация, регулирующая оборот медицинской техники в Европейской Союзе и за его пределами. Представлены правила классификации медицинской техники в США, а также показаны правила, которые регулируют предпродажную работу с медицинской техникой. Освещен вопрос о том, считает ли Управление по санитарному надзору за качест-

вом пищевых продуктов и медикаментов мобильные медицинские приложения медицинскими изделиями. Дано описание процесса регистрации медицинской техники в России. Представлены три европейские директивы, регулирующие оборот медицинской техники.

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Die zu den medizinischen Erzeugnissen in verschiedenen Ländern erhebt Ansprüche

Zusammenfassung: Die Regeln und die Normative, die die Wendung der medizinischen Technik regulieren, sind wichtig. Diese Normative beeinflussen direkt die Entwicklung und den weiteren Verkauf der medizinischen Technik. Im vorliegenden Artikel handelt es sich um die normative Dokumentation, die die Wendung der medizinischen Technik in der Europäischen Union und ausserhalb seinen Grenzen reguliert. Es sind die Regeln der Klassifikation der medizinischen Technik in den USA dargelegt, sowie sind die Regeln gezeigt, die die vorverkäufliche Arbeit mit der medizinischen Technik regulieren. Es ist die Frage darüber beleuchtet, ob die

Verwaltung nach der Hygieneaufsicht nach der Qualität der Lebensmittel und der Medikamente die mobilen medizinischen Anlagen als medizinische Erzeugnissen hält. Es ist der Prozess der Registrierung der medizinischen Technik in Russland beschrieben. Außerdem sind drei Europäische Direktiven dargelegt, die die Wendung der medizinischen Technik regulieren.

Exigences émises envers les articles médicaux dans de différents pays

Résumé: Règles et normes régulant le trafic de la technique médicale sont extrêmement importants. Ces normes influencent sur l'élaboration et la vente de la technique médicale. Dans le présent article il s'agit de la documentation normative régulant le trafic de la technique médicale en UE et dehors. Sont présentées les règles de la classification régulant la technique médicale aux USA ainsi que celles qui régularisent la vente. Est abordé le problème concernant le fonctionnement de l'Administration du contrôle sanitaire en ce qui se rapporte à la qualité des produits alimentaires et les articles médicaux. Est décrit le processus de l'enregistrement de la technique médicale en Russie. De plus, sont présentées trois Directives européennes régulant le trafic de la technique médicale.

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