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REVIEW ARTICLE

FDA'S NEW DRUG REVIEW PROCESS: AN OVERVIEW FROM OFFICIAL WEBSITE

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ABSTRACT

Drugs are the vital and inevitable part of modern day treatment strategies. Drugs are always directly related with lives of human beings. There should be very strict approval process before getting permission for their marketing and ultimate licence for use of humans. FDA (U.S. Food and Drug Administration) is an agency which plays a vital role in the approval of millions of drug for market distribution and selling purposes. FDA's Centre for Drug Evaluation and Research (CDER) is involved in the process of innovation and development of new drugs. Any new drug which is being invented always needs to go through the FDA's guidelines mentioned in this review. All the data mentioned in this review has been taken from the official website of FDA just for the simplification of the original procedure mentioned on the website.

KEYWORDS: Drug, FDA, clinical trial, new drug development

INTRODUCTION:

Drugs are the inevitable part of not only modern day treatment strategies, but also playing vital role in cure of various ailments since thousands of years. Since ancient times, various systems of traditional medicines are engaged in discovery of new treatment strategies for various disease treatments. For thousands of years most of the drugs were crude natural products of unknown composition and limited efficacy.[1]

Modern day treatment strategies majorly depend upon million numbers of drugs available in the international market. These drugs have been purified, chemically characterised and vast variety of highly potent and selective new drugs have been developed.[1]

The term 'drug' is derived for the French word Drogue that means dry herb.[1] It is the single active chemical entity present in the medicine which is used for diagnosis, prevention, treatment or cure of the disease.[1] According to WHO definition of the drug is "Drug is any substance or product that is used or is intended to be used to modify or explore physiological systems or pathological states for the benefit of the recipient."[2] This definition thus also includes vaccines, sera and diagnostic agents.

FDA(U.S. Food and Drug Administration) is an agency within the Department of Health and Human Services.[3] One of FDA's Centre for Drug Evaluation and Research (CDER) supports the pharmaceutical industry at every step in the process of innovation and development of new drugs.[3] With its understanding of the science used to create new products, testing and manufacturing procedures, and the diseases and conditions that new products are designed to treat, FDA provides scientific and regulatory advice needed to bring new therapies to market.[3] CDER supports innovation and plays a key role in helping to advance new drug development.[3] Each year, CDER approves a wide range of new drugs and biological products.[3] CDER is the largest of FDA's five centres.[4] It has responsibility for both prescription and non-prescription or over-the-counter (OTC) drugs.[4]

But, the process of the innovation and introduction of the drug into the market is not an easy process. It involves a series of stringent procedures starting from preclinical testing through animal experimentations upto post market surveillance of the drug. In this review, we have tried to simplify FDA's new drug regulatory process as per the guidelines mentioned in FDA's official website.

THE REGULATION OF DRUGS[5]

1. The first step for a company seeking approval to sell a new drug is to perform **laboratory and animal tests** to learn how the drug works and if it will be safe enough to be tested in humans. The company submits an **Investigational New Drug Application (IND)** for FDA's review prior to testing in humans.
2. The company performs a series of **clinical trials** in humans, which FDA monitors, to test if the drug is effective and safe.
3. Next, the company sends its data from all these tests to FDA's **Center for Drug Evaluation and Research (CDER)** in a **New Drug Application (NDA)**. A team of CDER physicians, statisticians, toxicologists,

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pharmacologists, chemists and other scientists review the data and proposed labelling.

4. If this review establishes that a drug's benefits outweigh its known risks for its proposed use, the drug is approved for sale.
5. After the drug is on the market, the FDA monitors its performance in a number of ways. One of those ways is the through **MedWatch,** the agency's safety information and adverse event reporting program, which receives reports of suspected adverse reactions (side effects of medicines) from consumers, health care practitioners and pharmaceutical companies. And the agency has access to databases that collect information on prescription drug use and health outcomes. These data help FDA staff identify and understand side effects of medicines.
6. If an unexpected drug-related health risk is detected, **Drug Safety Communication** may be issued to consumers and healthcare professionals. A statement is added to the drug label about the new safety concern to ensure continued safe and effective use of the drug. Occasionally, approved drugs may be withdrawn from the market for serious safety risks if it is determined that the overall risks outweigh any benefits the drug may provide.

ENSURING DRUGS ARE SAFE AND EFFECTIVE:

The path a drug travels from a lab to your medicine cabinet is usually long, and every drug takes a unique route. Often, a drug is developed to treat a specific disease. An important use of a drug may also be discovered by accident.

Most drugs that undergo preclinical (animal) testing never even make it to human testing and review by the FDA. The drugs that do must undergo the agency's rigorous evaluation process, which scrutinizes everything about the drug--from the design of clinical trials to the severity of side effects to the conditions under which the drug is manufactured.

STAGES OF DRUG DEVELOPMENT AND REVIEW[6]:

STAGE 1

Investigational New Drug Application (IND)--The pharmaceutical industry sometimes seeks advice from the FDA prior to submission of an IND.

Sponsors-companies, research institutions, and other organizations that take responsibility for developing a drug. They must show the FDA results of preclinical testing in laboratory animals and what they propose to do for human testing. At this stage, the FDA decides whether it is reasonably safe for the company to move forward with testing the drug in humans.

STAGE 2

Clinical Trials-Drug studies in humans can begin only after an IND is reviewed by the FDA and a local institutional review board (IRB). The board is a panel of scientists and non-scientists in hospitals and research institutions that oversees clinical research.

IRBs approve the clinical trial protocols, which describe the type of people who may participate in the clinical trial, the schedule of tests and procedures, the medications and dosages to be studied, the length of the study, the study's objectives, and other details. IRBs make sure the study is acceptable, that participants have given consent and are fully informed of their risks, and that researchers take appropriate steps to protect patients from harm.

STAGE 3

Phase 1 studies are usually conducted in healthy volunteers. The goal here is to determine what the drug's most frequent side effects are and, often, how the drug is metabolized and excreted. The number of subjects typically ranges from 20 to 80.

STAGE 4

Phase 2 studies begin if Phase 1 studies don't reveal unacceptable toxicity. While the emphasis in Phase 1 is on safety, the emphasis in Phase 2 is on effectiveness. This phase aims to obtain preliminary data on whether the drug works in people who have a certain disease or condition. For controlled trials, patients receiving the drug are compared with similar patients receiving a different treatment--usually an inactive substance (placebo), or a different drug.

Safety continues to be evaluated, and short-term side effects are studied. Typically, the number of subjects in Phase 2 studies ranges from a few dozen to about 300.
At the end of Phase 2, the FDA and sponsors try to come to an agreement on how large-scale studies in Phase 3 should be done. How often the FDA meets with a sponsor varies, but this is one of two most common meeting points prior to submission of a new drug application. The other most common time is pre-NDA--right before a new drug application is submitted.

STAGE 5

Phase 3 studies begin if evidence of effectiveness is shown in Phase 2. These studies gather more information about safety and effectiveness, studying different populations and different dosages and using the drug in

combination with other drugs. The number of subjects usually ranges from several hundred to about 3,000 people.

STAGE 6

Post market requirement and commitment studies are required of or agreed to by a sponsor, and are conducted after the FDA has approved a product for marketing. The FDA uses post market requirement and commitment studies to gather additional information about a product's safety, efficacy, or optimal use.

STAGE 7

New Drug Application (NDA)- This is the formal step a drug sponsor takes to ask that the FDA consider approving a new drug for marketing in the United States. An NDA includes all animal and human data and analyses of the data, as well as information about how the drug behaves in the body and how it is manufactured.

STAGE 8 & 9

When an NDA comes in, the FDA has 60 days to decide whether to file it so that it can be reviewed. The FDA can refuse to file an application that is incomplete. For example, some required studies may be missing. In accordance with the Prescription Drug User Fee Act (PDUFA), the FDA's Centre for Drug Evaluation and Research (CDER) expects to review and act on at least 90 percent of NDAs for standard drugs no later than 10 months after the applications are received. The review goal is six months for priority drugs.

STAGE 10

FDA reviews the drug's professional labelling and assures that appropriate information is communicated to health care professionals and consumers.

STAGE 11

FDA inspects the facilities where the drug will be manufactured.

STAGE 12

FDA reviewers will approve the application or issue a complete response letter.

DRUG REVIEW STEPS SIMPLIFIED[7]

Preclinical (animal) testing
↓
An investigational new drug application (IND)
↓
Phase 1 studies
↓
Phase 2 studies
↓
Phase 3 studies
↓
Submission of a new drug application (NDA)
↓
Submission of an NDA
↓
60 days period for FDA for review
↓
Assignment of FDA review team for evaluation of sponsor's research
↓
Professional labelling
↓
Inspection of the facilities of drug manufacture
↓
Approval or response letter

CONCLUSION:

FDA plays a vital role in the approval of millions of drug for market distribution and selling purposes. Drugs are always directly related with lives of human beings. Hence it is obvious that they should go through very stringent approval process before getting permission for marketing and ultimately getting used for human use in various diseases. FDA faces a balancing act in evaluating a new drug. In this review, we have not invented anything new or unknown for all, but had just tried to simplify this complicated process for a better understanding of all. All the data mentioned in this review has been taken from the official website of FDA.

REFERENCES:

1. KD Tripathi. General Pharmacology. In Essentials of Medical Pharmacology. Jaypee Brothers Medical Publishers (P) Ltd. New Delhi. 2006; 6th ed: 4.
2. Available from: http://whqlibdoc.who.int/trs/WHO_ TRS_425.pdf. Last accessed on 5th April 2013.
3. Available from: www.fda.gov/Drugs/Development ApprovalProcess / DrugInnovation / default. htm .Last accessed on 5th April 2013.
4. Available from: http://www.fda.gov/Drugs/ Development. ApprovalProcess/HowDrugsareDevelopedand Approved/de fault. htm. Last accessed on 5th April 2013.
5. Available from: http://www.fda.gov/AboutFDA/ Transparency/Basics/ucm269834.htm. Last accessed on 5th April 2013.
6. Available from: http://www.fda.gov/Drugs/Resources ForYou/Consumers/ucm295473.htm. Last accessed on 5th April 2013.
7. Available from: http://www.fda.gov/Drugs/Resources ForYou/Consumers/ucm289601.htm. Last accessed on 5th April 2013.