

## DIRECTION TO REACH CLOSER TO THE EFFECTIVE LABELING OF DRUGS WITH CRITICAL PARAMETERS

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### REVIEW ARTICLE

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#### ABSTRACT

Labeling of drugs is an art of expressing information, instructions, caution or warning etc. in both word and pictorial form which must be readable without magnifying glass or visualizing aids. Font size and background of the label play an important role in reading the label considering the level of literacy in India. Food Safety and Standards Authority of India (FSSAI) framed a rule in the year 2011 to improve labeling of foods in the light of the new advancement of Science and Technology.(1) This study observed that manner of labeling and labeling criteria of drugs remain unaltered in comparison to foods or other food products.

**Keywords:** Label, Rules, Legible Fonts, Pictorial, Act.

#### INTRODUCTION

In India, a large percentage of the people are illiterate and poorly informed regarding medicine. Most of the critical goods, even sometimes, including drug of Indian system of medicine are supplied without having life period and other statutory information.

Pharmaceutical manufacturing companies are in the business of synthesizing bulk drugs and/or converting the raw materials (bulk drugs), into finished formulations that are of far more value and use to the consumers/patients than the original raw materials the identification, information/instruction related to the finished product are introduced through the labeling of those final products (formulations).

Pharmaceutical manufacturers are unable to appeal to all the buyers in the market in the same way since purchasers are too numerous, too widely scattered and too varied in their buying needs and buying practices.

Human's understanding of the real world is limited. Tools and techniques for carrying out the plans are less matured. Pharmaceutical goods produced are not always in line with consumer's preference. The unpleasant reality is

that the technological up gradation is not applied for the benefit of consumer's preference in terms of labeling of drugs and manner of labeling.

For protection safety and the interests of the consumer, Indian government has taken significant initiative by legislative measure, through various acts such as the Drugs and Cosmetic Act 1940, the Sale of Goods Act 1930, the Trade and Merchandise Marks Act 1958, the Essential Commodities Act 1955, the Prevention of Food adulteration Act, 1959 the Drugs and Magic Remedies (Objectionable Advertisement) Act 1954, the Consumer protection Act 1986 and lately Food Safety and Standards Act 2006.

The label containing logo, title or trade mark, hologram etc. of a product of a manufacturer requires distinguishing the product from the other manufacturers. The state of even being the same in substance nature, the qualities etc. are differentiated by the label by the consumers. The absoluteness of a product is generally identified by the label by the customers. However many anomalies and lacunae are existing in case of pharmaceutical product labeling. Therefore, considerable rethinking and reinforced required for labeling of drugs to meet

the patient’s social justice. In the present, we will highlight some of such existing lacunae as investigated by us and will also try to provide possible solution of each of them.

**LABELING AND ITS BASIC OBJECTIVE**

Displaying instructions and information about a product on its innermost container or packaging or the product itself is important for drugs. Consumers absorb information from the label in three ways namely visually, auditory and kinaesthetically. Effective information and instructions on the label must be accurate in order to guide and educate the patients or consumers properly.

**Some instructions significant on the labels of formulations:**

After several modifications of the present drug laws, the manufacturers of the modern medicine require to mention certain particulars and instructions on the label or pack or package of the drugs.

At present, the manufacturers have to print all the required particulars as described by Rule 96 of the Drugs and Cosmetic Rules 1945 on the labels/pack of the formulations (eg. tablet/capsule/ointment etc.) in their own way. (2)

Section 96 of the Drugs and Cosmetic Rule 1945 has described that ‘Particulars shall be either printed or written in indelible ink and shall appear in a conspicuous manner on the label of the innermost container of any drug and on every other covering in which the container is packed’.(3) The generic name of the drug should be mentioned in a more noticeable manner than the brand name, if any. Warning, instructions for use, precautions, storage, drug interactions, contraindications, adverse reactions etc. should be printed. Therapeutic efficacy of certain products depends on their storage condition and hence it requires keeping the product in an applicable temperature range and storage conditions are mentioned.

**Problems and lacunae associated with labeling and their possible solutions**

The abbreviated name “Warfarin Sod” instead of “Warfarin sodium” causes confusion to the patients, though “Warfarin” (important part of the name of the medicine) is kept intact. The drug name appears as 12-point type (though the point size is a variable parameter that can vary depending on the font size).



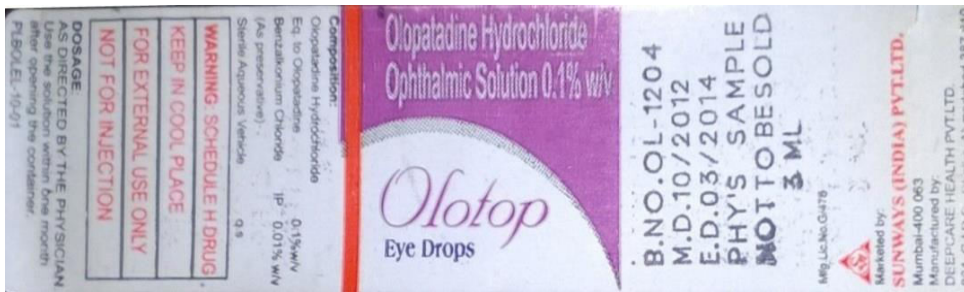
a



A



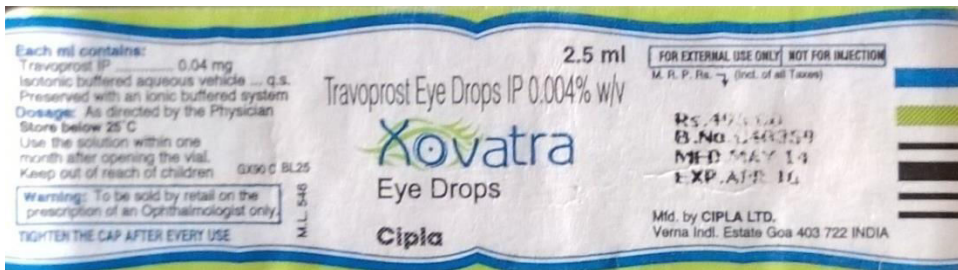
b



B



c



C

Figure 1: The representative labels (A, B, C) are expanded version (Dimension: 12.5 cm x 3.5 cm) of the original (a [6.6 cm x 1.8 cm], b [7 cm x 1.8 cm], c [5.5 cm x 1.5 cm]). Approximately 3.7 times, 3.5 times and 5.3 times magnification have been done for the labeling A, B, C respectively.

Table 1: Some important drug schedules and their mandatory regulatory additional instruction

Sr. no	Drug Schedule	Mandatory additional labeling instruction
1	Schedule G Drug	Label should contain the words of caution such as “it is dangerous to take this preparation except under medical supervision” and this part of label should be bordered by a line within which no other words should be presented.
2	Drugs specified in Schedule H	Label should display the symbol R <sub>x</sub> on the top left corner, also should mention the words “Schedule H drug- warning: To be sold by retail on the prescription of a registered medical practitioner only”.
3	Drugs specified in Schedule H	Be labeled with the symbol NR <sub>x</sub> (in red) conspicuously displayed on the left top corner of the label “ Schedule H drug-warning: To be sold by retail on the prescription of a registered Medical Practitioner only”
4	Substances specified in Schedule X	Be labeled with the symbol XR <sub>x</sub> which shall be in red conspicuously displayed on the left top corner of the label and be also labeled with: “Schedule X drug: Warning: To be sold by retail on the prescription of a “Registered Medical Practitioner only”
5	The container of liniment, lotion, liquid antiseptic or other liquid medicine for external use.	Be labeled with the words in capital “For external use only”
6	Container of medicine ready for an animal	be labeled with the words “Not for human use: for treatment animal treatment only and shall bear a symbol depicting the head of a domestic animal”

When the dosage instructions are in lesser point (approximately 8), they seem to be lighter in many cases. The warning portion of the label is colourful, in smaller type and printed on the side of the container.(4) Summing up, the label should be informative, simple, readable, prominent, having proper color scheme and size. Misunderstanding due to abbreviated label claim can be avoided by proper labeling as abbreviation on the label may be misleading in understanding the content. Style or type of lettering should be bold and distinct.

The typeface and style on the label particularly with “warning” or “instructions” should be distinct for understanding of the matter by the consumers/patients. In case of patient using antacid – the warning should be “Excessive use of Antacids may possibly result in digestive problems mainly diarrhoea or constipation.” In addition, patient suffering from hypertension or patients having a history of heart failure should not take sodium bicarbonate as it accumulates plenty of salts. (5)

### **Direction for reconstruction**

Patients or consumers require clear instruction/information about ‘Direction for Reconstruction’ which should be legible and readable against the background if used. Such instructions could be “Use enclosed sterile water for injection (WFI) to reconstitute the powder up to the mark shown on the bottle. Shake well. Adjust the volume up to the mark with more WFI (if necessary) and shake. Store the reconstituted suspension in a refrigerator. Protect from light. Use the reconstituted suspension within 7 days. Discard remaining sterile WFI.” And “Shake well before each dose” for Amoxicillin and Potassium Clavulanate oral Suspension IP.

In case of control release drug, the patients must be informed through a special instruction that “the drug should not be taken if broken or divided. If it is taken in broken form the desired effect could not be achieved.” For sublingual tablets, if it is taken orally instead of placing below the tongue the desired effect could not be achieved. Hence, a suitable label should be provided for the proper guidance of consumers.

Drugs being a highly sensitive commodity/chemical/device etc. if not purchased/stored/dispensed or reconstituted/consumed (before or after or within meal) in accordance with the instruction/ information given on the labels or packs, it may also cause harmful effect to the consumers/ patients. Mostly the printing which is unreadable or partially readable without aid the label plays a major role in the confusion.

Critical drug interaction requires alert precautions to avoid sufferings. For example, when oral contraceptives are taken along with some enzyme inducers (e.g. barbiturates, carbamazepine, phenytoin, primidone, rifampicin, griseofulvin etc. which induce the enzymes, such as cytochrome P450), drug interactions results. Its nature of interaction and clinical outcome should be mentioned on the label as: the enzyme inducers reduce the effects of oral contraceptives which could result in failure of contraception and menstrual irregularities.

The enzyme inducers increase the hepatic metabolism of oral contraceptives leading in reduced bioavailability, especially of the estrogens. Alert precautions may be included on the label to solve such issue. There may be instruction such as “Patients should avoid enzyme inducers while taking oral contraceptives regularly”. The non-hormonal methods of contraception are recommended to combat such situation.

Combined administration of Frusemide and Aminoglycosides (Gentamicin /Streptomycin /Tobramycin / Netilmicin / Kanamycin /Amikacin) can interact with both pharmacodynamically and pharmacokinetically though the former is the utmost important. Clinically there is tinnitus and progressive deafness which may be irreversible. Vertigo and /or dizziness may occur due to vestibular damage. Frusemide may also worsen the nephrotoxic effect of aminoglycosides.

Alert precautions such as “Concomitant administration of aminoglycosides and frusemide should be avoided” may be included on the label.

Further, the usual practice of chemist's shop is to cut/break the strips (minimum saleable unit as per manufacturer pack) on demand of consumers/patients. These practices may lead to deprive the patients/user getting actual information/instructions given for the medicines.

### Pictorial aids

The use of pictorial aids enhances patients' understanding about how a patient should take their medication especially when pictures are used in combination with the instructions. Many people depend on the labels of medicines and information leaflets for OTC product user. A

research has been carried out on psychology and marketing; and it reveals that humans have a cognitive performance for picture based rather than text based information. (6)

Instructions on the label may be printed in words or pictorial diagram or graphics. However, information in the form of a pictorial diagram or graphic matter printed on the label should not create any conflict.

### ACTS TACKLE LABELING PROBLEMS

Several acts and rules were framed initially for the systematic and safe use of medicaments. However, loopholes of the acts are used by the manufacturer by way of misleading in labeling.

**Table 2: Comparison of labeling requirements between Drugs and cosmetic Act 1940 & Food Safety and Standards Act, 2006**

Requirements	Labeling	
	Drugs and cosmetic Act 1940	Food Safety and Standards Act 2006
Readability in normal vision	Not specified regarding legibility	Legible by the consumers Under normal conditions of Purchase and use
Instruction for use	no instruction for sublingual tablet or effervescent tablet or control release tablet etc	Instruction for use to ensure correct utilization of the food
Understand ability	Not strictly specified	Legible and prominent, definite, plain, and unambiguous
Colour-size-contrast	No clear instruction	Conspicuous as to size, number and color.

As the patient is a consumer, the consumer protection is required and hence another act (consumer protect act) has been enacted. This act should make a complete and accurate disclosure, in the easy-to-understand language of the precise term of credit etc. Thus the consumer protection act should be implemented more actively considering the above mentioned points in India too, to tackle such similar situation.

The Prevention of Food Adulteration Act 1954 (7), the Legal Metrology (Packaged Commodities) Rules 2011, FSS Act 2006 / Rules and Regulations 2011 are also effective in India. These two rules are applicable for food and other commodities respectively and marketed in this country. The labeling provisions for drugs and cosmetics rules also exist. These two rules provide clear instructions regarding minimum font size and plate

dimension of a label (background and pictorial) so that most of the particulars are easily readable and understandable for the consumers. But when the Drugs and Cosmetic rules are applicable for medicines, these two rules are not covering the medicines so stringently.

**Table 3: Basic Requirements of printing criteria on the formulation label and where we stand now**

i)	Font size	No font size specified, very low font size make the label not legible and Prominent
ii)	Plate size	No plate size specified or within the per view of labeling under the D&C Act 1940
iii)	Background (For Strip)	Back ground should be such that helps the label

	& Blister)	readable(not enacted)
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## DISCUSSION

Errors in medication serve the prevalent cause of morbidity and fatality, costing billions of dollars globally. About 30% mortalities due to such medication errors are due to labeling and packaging errors of the medicines which require a policy response in urgent basis.(8) In the present scenario, types of medication errors in the health care system include improper dosage forms, time interval, route of administration and last but not the least missed dose that become a great deal for improved patient care.(9)

Mostly labeling errors occur due to some simple but critical mistakes such as lack of mentioning the name of drug properly and its strength and dosage form. In some cases, containers do not contain that information or the information are not prominently displayed and/or expressed in a confusing manner. Sometimes problems arise, when the labeling is not readable without rotating the container or due to the glossy background of the metal foils with a print of very small font size. Small print or poor printing of the label are unable to ensure that the information on the labeling are accessible and cannot be understood by those who receive it, resulting in the unsafe and inappropriate use of the medicine. Route of administration should be given with special prominence. It should be mentioned without any abbreviation and should remain always as a positive statement. Negative statements like “not for intrathecal use” can cause errors by the end users when the word ‘not’ is overlooked. (10)

Similar sounding brand names, generic names, and brand-to-generic names can cause medication errors and likewise, abbreviations, acronyms, dose designations, and other symbols used in medication prescribing may cause medication errors.

For the purpose of reducing medication errors caused by labeling mistakes, understanding of the medico-legal importance for better communication with the consumers may be a key factor. However incorporation of bar code, waterproof nature, embossing, increased font size, improved language clarity and variety, and ultimately a sense of responsibility are assumed

to be a solution for readdressing the shortcomings of labeling of medicines.

## CONCLUSION

Considering the level of literacy and multiple language problems in India and essentiality of medicine for all classes of people, some particulars/ instructions if given in pictorial form along with the written form may be beneficial for the patients/ consumers. If some modifications in the concerned rules for labeling should be done in line of Food Safety and Standards Act and Rule 2011 and package commodities Rule 2011. Effective labeling could be achieved beyond a piece of paper or print on the pack of medicine. The Drugs and Cosmetic Rules may be further framed for minimum pack size and should prevent the chemists to sell the medicines by cutting the minimum pack.

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## CONFLICTS OF INTEREST

Author declares that there are no conflict of interest in this work.

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