

# Barrier-free Design of Drug Packaging Based on Visual Communication

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**Abstract:** With the decline of eyesight, cognition and memory of the elderly, there are inevitably obstacles in the identification of drug packaging information. Drug packaging for the elderly should be able to accurately convey the use information of drugs, be easy to operate, and guide the elderly to take drugs on time and according to the quantity. At the same time, emotional semantic design should be used to relieve the anxiety of the elderly and give them psychological comfort while treating diseases. There are mature barrier-free design specifications at home and abroad, but there is a lack of barrier-free design of drug packaging specifically for the elderly. In order to make the expression of visual information in barrier-free packaging design more scientific, reasonable and accurate, the graphic design in barrier-free packaging should be concise and targeted, the word design should be legible, the layout should be reasonable, the color should have a certain degree of recognition, and the design should be combined with graphics and words, so as to achieve the goal that the packaging design tends to be more humanized.

## 1. Introduction

With the aging of the world population and the rapid development of medical undertakings, improving the health and medication safety of elderly patients has become a hot spot [1]. The main function of drug packaging is to ensure the safety, effectiveness and stability of drugs for a long time under the influence of various external environments, which is closely related to the quality of drugs and the safety of patients [2]. The elderly are not only the high incidence population of diseases, but also the main consumers of drugs. Due to the decline of their physiological function, the elderly have many problems when using drugs. The ability of eyesight, hearing, grip strength and memory decreases, which makes the elderly distinguish the types of drugs only by the appearance of drugs in the process of taking drugs, and bring a huge burden on remembering the amount of drugs and taking time [3]. At the same time, the physical function of the elderly is degraded, the muscle strength is insufficient, and the joint activity is not flexible, so it is difficult to disassemble the drug packaging. Therefore, the actual physiological and psychological characteristics of the elderly must be taken into account in the design of drug packaging. Whether the drug packaging can accurately convey the essence of drugs, respect the feelings of patients, make the design conform to the taste and lifestyle of the target population, and whether it is people-oriented is the new requirement of drug packaging [4].

The industrialization process of drug manufacturing and packaging industry makes drugs easy to store and circulate. Therefore, the development of drug and its supporting manufacturing industry has gradually become the focus of attention. In recent years, the degree of aging in China has been higher than that in most developed countries such as the United States [5]. Therefore, how to design drug packaging to help the elderly identify and understand, and take care of the physiological and psychological needs of the elderly on the basis of maintaining drug information has become a new topic in the industry [6]. Drug safety also depends on the safety of drug packaging design to a certain extent. With the development of pharmaceutical industry and pharmaceutical packaging enterprises, the continuous improvement of people's living standards and the change of medication habits, patients have increasingly improved their understanding of the importance of drug

packaging, and pay more attention to the design of drug packaging and the accessibility and safety of packaging [7]. The physiological function of the elderly is gradually declining. It is necessary to design safe barrier free packaging for some exclusive drugs for the elderly. Elderly drug packaging should pay special attention to people-oriented. Through scientific and reasonable creative design, the accessibility of information acquisition based on efficacy and safety, the accessibility of use process based on taking safety, and the accessibility of emotional communication based on psychological safety are realized. Maintain the health and safety of consumers [8]. Combined with the physiological characteristics of the elderly, the research on the barrier free opening application design of drug packaging will fill the vacancy in the market and has very important practical significance. Based on the concept of barrier free design, combined with packaging design cases, this paper analyzes from the aspects of graphics, text and color, and obtains the expression law of visual information in barrier free packaging design.

## **2. Barrier-free drug packaging**

### **2.1. Problems in barrier-free drug packaging design**

In China's pharmaceutical market, the visual image design of pharmaceutical packaging has been a weak link for a long time, and most pharmaceutical companies basically don't consider the reading habits and visual requirements of users on pharmaceutical packaging. The eyes of the elderly are slow in screening and processing external information, and the amount of information processed is small, so drug packaging makes it difficult for the elderly patients to identify information [9]. The eyesight of the elderly began to decline, their feelings gradually became dull, their actions became sluggish, and their memory kept declining, which caused some troubles for them to use drugs safely. With the growth of people's age, the aging of body tissues reduces people's perception and adaptability. The information of drugs in drug packaging is relatively small, and the recognition degree of color and graphics is low, which limits the normal medication of elderly patients. Most drugs have small fonts and dense word spacing in the information parts such as prescription, main treatment, usage, etc., which can't be recognized by the elderly. Text information of drug packaging is one of the important ways to convey the basic information of drugs. However, in many cases, small words and complicated contents make it difficult for patients to obtain drug information, especially for the elderly group with vision deterioration and cognitive difficulties, dense pure words will reduce the efficiency of information transmission, and drug packaging does not consider physiological and psychological problems.

In recent years, the proportion of the elderly in China is increasing. The aging industry has become an important part of China's future economic development, and improving the health and medication safety of the elderly has become a hot spot of widespread concern. Due to physiological reasons, the elderly are increasingly dependent on drugs, and taking drugs has become a "daily work" for many elderly people. In recent years, many changes have taken place in the mentality of the elderly. Many drug packaging designs in the market lack affinity. Old-fashioned design and lack of new ideas will make patients feel bored with medication. Drug packaging design should take into account the special growth experience and background of the elderly. Most elderly people have experienced the era of panic such as war, liberation and famine [10]. They like stability, are often nostalgic, have poor acceptance of new things due to the formation of fixed patterns, look forward to recognition, emphasize self-esteem and long for dependence. However, the drug packaging on the market lacks the design for the elderly, and there are some problems, such as mixed packaging colors, different font sizes, nonstandard graphic design, unclear information content, inconvenient package opening and so on. It is of far-reaching theoretical, practical and social significance to study the barrier-free information communication design of drug packaging for the elderly.

### **2.2. The expression of visual information in barrier-free packaging design**

Packaging visual information design is a process of understanding and combing the content information of commodities, and organizing effective information by combining design elements

such as words, graphics, colors and materials. Vision is produced by the refraction and focusing of the object image through the cornea and lens under the action of light, stimulating the retina located at the posterior wall of the eyeball, and then being diagnosed, interpreted and processed by the brain nervous system. In packaging information communication design, "comprehensibility" and "easy to see" are used as a criterion to measure the success of the design. However, people with visual disabilities have some difficulties in reading and receiving packaging visual information. When they can't understand the product information through the mode of "seeing", they can get relevant information through sensory touch, hearing, smell and taste. At present, the drug packaging on the market adopts universal design, without considering the physiological characteristics of the decline of the logical thinking judgment ability of the elderly. In visual recognition, the old people have presbyopia due to their eyesight decline, and they can't see small fonts clearly. The eyeball lens turns yellow, and the color of low frequency wave cannot be recognized; Brain cells decrease, sensory response slows down; Muscle atrophy, unable to open the package smoothly. The mask barrier-free packaging design based on visual information transmission is shown in Figure 1.



Figure 1 Mask barrier-free packaging design based on visual information transmission

The graphics on barrier free packaging are conceived and expressed by designers using creative visual graphics language, so as to achieve the purpose of packaging commodity sales information dissemination. The right medicine is the foundation of treatment, and scientific, reasonable, timely and quantitative medication is the basic guarantee to achieve safe treatment, which requires that drug packaging can provide patients with clear medication information. Barrier free design was first applied to urban buildings, public environmental equipment, roads and vehicles. Its main audience is relatively vulnerable groups such as the disabled and the elderly. Its purpose is to make the social vulnerable groups can use the products conveniently, quickly and safely, provide them with care design from the physiological and psychological aspects, and create a healthy and equal social environment. There is a great difference between the cognitive graphics of visually impaired people and ordinary graphics. Especially for some elderly people, they pay more attention not only to the fancy graphics on the packaging, but also to the emotions expressed by the packaging. For the elderly drug packaging, on the one hand, information accessibility design is embodied in the accessibility of text design; On the other hand, it is embodied in the barrier free design of reminder function. Designers should scientifically and reasonably extract the key information of graphics and grasp their typical characteristics, so as to design accurate, true, fresh and pleasant graphics.

### 3. Application of barrier-free design in medicine packaging

It is the most direct way and means for word packaging to convey product information and exchange ideas to consumers. Words are the most important media symbol to convey drug information. The information of drug ingredients, functions, indications, usage and dosage, adverse reactions, product batch number, expiration date, pharmaceutical enterprises and so on basically

depend on words to convey. In order to meet the visual needs of the amblyopia and the elderly, the text design on the package must be easy to read, recognize and remember, so that these amblyopia groups can get the text information on the package more accurately and easily. For the elderly patients, it may be necessary to consider the packaging design from the perspective of "accessibility". Understanding the explanatory words on the outer packaging is the most basic requirement for safe medication, and the decline of vision of the elderly has become a prominent obstacle. Visual element refers to the basic unit of visual object, the tool and medium for human to receive and convey information, the words and symbols of visual communication language, and the basis for human to know and understand the information and changes of external things. From the point of view of information acquisition, one of the most basic requirements of the elderly drug packaging text design is clear and eye-catching. The operation flow of barrier-free packaging design based on visual communication is shown in Figure 2.

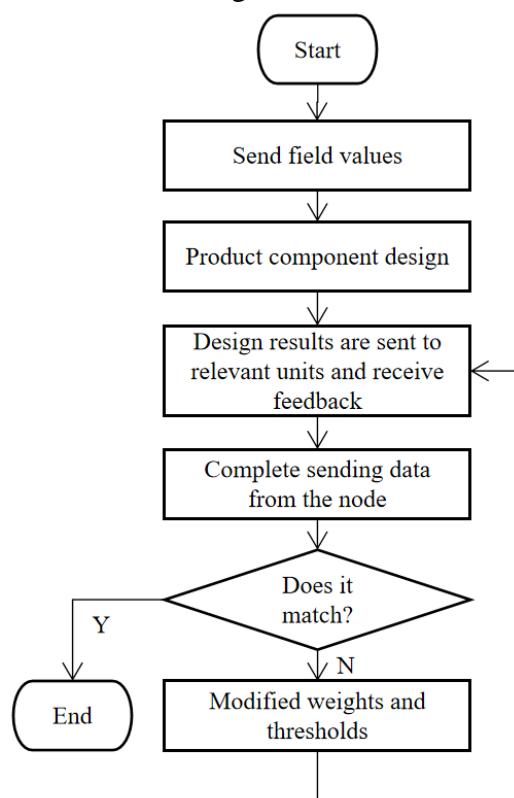


Figure 2 Packaging design operation process

It is one of the three elements to transmit information in character packaging design. For text design in barrier-free packaging, fonts must serve the eyes of consumers, so readability is a problem that needs attention. Barrier-free font design is based on the understanding and flexible use of the meaning of words, and the design of the size, strokes, structure, arrangement and other elements of words follows the aim of accurate and fast information transmission. In packaging design, the text design on the visual interface should be concise and clear, so that people can most effectively understand the product information in the instant visual contact process. Reasonable line spacing will quickly guide readers' eyes, and the width of line spacing will affect the speed of text reading. When the line spacing is too wide, the connection between text information and information will become loose and the reading speed will slow down. When the line spacing is too narrow, the characters will appear too crowded, which will cause reading difficulties for readers. Through barrier-free font design, we can not only transmit information efficiently, but also make use of the profoundness of Chinese characters to make more people realize the implicative and profound Chinese culture and intriguing artistic aesthetics.

#### 4. Conclusions

China is facing the coming of an aging society, and the elderly are gradually becoming the main consumers of medicines. "Drug packaging", as a kind of special commodity packaging, on the one hand, bears the demand of ensuring the quality and safety of drugs through various strict and standardized science and technology and reasonable and appropriate design. The packaging of medication for the elderly should be characterized by scientific and reasonable information design and convenient design. Drug packaging for the elderly should pay more attention to the organic combination of pharmacological properties and warm emotional care of drugs through scientific and reasonable creative design. Barrier-free packaging design should meet the physiological and psychological needs of the elderly and reverse the indifference of mechanized production. Packaging design should enable users and commodities to communicate without any hindrance. Bring happy emotional care and convenient use experience to the elderly. Based on the analysis of the psychological, physiological and emotional needs of the elderly, this paper probes into the barrier-free design of drug packaging based on visual communication, with the visual elements of drug packaging for the elderly as the mainstay and the behavioral orientation and emotional design of packaging as the supplement.

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