The color of liquid medications can have a big impact on how patients perceive, experience, and take medications. | Image Source: Pexels user **Pixabay**

Last winter, in the midst of my worst cold of the season, color-coded mediation led me astray. Dazed, I reached into my medicine cabinet and popped a blue liquid-filled capsule out of its packaging, ready to get some symptom relief and finally be able to rest. But that's not what happened. Rather than falling into a deep sleep, I felt jittery with unwanted energy and paced around my house in the early hours of the morning, unable to stay still. Sure, my cold symptoms were held at bay, but what I needed was rest. Confused, I returned to the medicine cabinet and took a closer look at the box of cold medicine. It was then that I saw the blue capsules were for daytime while the pale yellow capsules were for nighttime, the polar opposite of my feverish assumptions. That sleepless night made me appreciate the value of logical and correct medication color more than ever before.

Since the 1970s, pharmaceutical companies have increasingly recognized the value of color in medications. | Image Source: Pexels user **freestocks.org**

The Value of Color in Pharmaceuticals

Until the mid-20th century, virtually all pill pharmaceuticals were white and all liquid pharmaceuticals were clear.[1] But in 1975, the introduction of soft gel capsule technology made it possible to produce vibrantly colored medications for the first time and the idea took off. Today, pharmaceuticals, particularly liquid forms, come in an endless array of hues.

This emergence of pharmaceutical color isn't just about arbitrary aesthetics. The color of medication matters and it matters in multiple ways:

Shaping Patient Perception

The color of medication can have a significant impact on the expectations consumers have regarding efficacy and performance. A 2015 study published in Food Quality and Preference found that white headache medications were perceived as the most effective by respondents, while light green medications were assumed to be the least effective. Respondents also reported that they perceived red and light red pills to be the most stimulating and they expected light blue pills to have the most pleasing taste. Some also reported that they expected red and blue pills to be harder to swallow than pills of other colors.[2] As such, pharmaceutical companies are increasingly interested in creating medications that enhance consumer perception through the creative use of color.

Shaping Patient Experience

Not only does the color of medication affect people's expectations, it also affects what they actually experience. As Jill Morton of Color Matters notes, "Patients respond best when color corresponds with the intended results of the medication." For example, blue sleep medications help people achieve better quality sleep than medications of other colors, even if the ingredients are identical. Thoughtful selection of medication color as it relates to each specific medication is, therefore, paramount to optimize efficacy and create the best possible user experiences.

Promoting Adherence

Colors can act as visual shortcuts to identifying pharmaceuticals, helping people who have difficulties reading labels or who are dealing with multiple medications easily pick out a particular medication on sight. As the population ages and comes to depend on a growing number of daily medications, pharmaceutical companies are increasingly implementing color-coding strategies in both packaging and in the design of the drugs themselves to facilitate adherence and minimize medication errors. Researchers have also found that maintaining consistency between brand name and generic medications is critical to decreasing rates of discontinuation, putting new pressure on manufacturers of generic drugs to prioritize the aesthetics of their products.[3. If Color or Shape of Generic Pills Changes, Patients May Stop Taking Them," July 14, 2014, https://www.washingtonpost.com/national/health-science/if-color-or-shape-changes-patients-more-likely-to-stop-taking-much-needed-drugs/2014/07/14/60e687f4-0b8c-11e4-8341-b8072b1e7348_story.html]

HunterLab's Vista allows for simultaneous color and haze measurement, simplifying quality control procedures. | Image Source: Flickr user **Sean Michael Ragan**

Simultaneous Color and Haze Measurement

Liquid medications present opportunities for rich colors that enhance patient perception, experience, and adherence in ways we could not have imagined a century ago. The important roles served by these colors mean that color monitoring must be a critical component of quality control efforts throughout the manufacturing process. Spectrophotometric color measurement offers the best way of analyzing color behavior at all points of production quickly and easily. By capturing objective color data and instantly alerting you to unwanted color variation, you can ensure that only correctly colored pharmaceuticals are released into the marketplace. As a growing number of consumers come to rely on color-coding, this is essential for protecting public health and preventing medication errors as well as fortifying brand image.

But color is only part of the equation when it comes to liquid pharmaceuticals. Monitoring turbidity, or haze, is critical for creating medications with correct formulations and desirable physical attributes. Not only can the presence of haze point to a potentially dangerous process error such as incomplete dissolution, it can also compromise consumer confidence and cause confusion for those who rely on visual identification. As such, haze measurement is an essential part of quality control protocols. Today, advances in spectrophotometric technology allow color and haze to be analyzed together in a single measurement using revolutionary instruments such as HunterLab's Vista. By measuring color and haze simultaneously, you can avoid time-consuming double measurements and reduce product waste. This is particularly important for those working with highly valuable, rare, or potentially hazardous materials, helping you minimize the number of samples necessary for accurate analysis and limit operator exposure to potent chemicals.

HunterLab Quality

HunterLab has been a leader in the field of spectrophotometry for over 60 years. Our renowned line of productshas been developed in response to the needs of our customers in the pharmaceutical industry, helping us ensure that our technologies can be readily integrated into your quality control program. With the release of the HunterLab Vista, we are entering a new era of liquid color and haze measurement, opening up the door to more rapid, simple, and economical analysis. In doing so, we expand your ability to make innovative use of pharmaceutical color while safeguarding consumer health. Contact us to learn more about our comprehensive range of spectrophotometers, customizable software packages, and world-class customer support services.

1. "The Color of Medications", http://www.colormatters.com/color-symbolism/the-color-of-medications
2. "Assessing the Expectations Associated with Pharmaceutical Pill Colour and Shape", June 2015, http://www.sciencedirect.com/science/article/pii/S095032931500138X