

# Patient Convenience Packaging Innovations

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**Abstract:** *The conventional packaging of medicine has some limitations like chances of non-medication adherence, overdosing and other common regular life mistakes. This review covers inventions which can help to improve patient medication adherence using approaches like making advancement in dispensing containers, using dispensing strategies and combination of them. Improvement in medical adherence in patients leads to better healthcare outcomes. Advancement in dispensing systems will help to reduce loss due to medication non-adherence worldwide.*

**Keywords:** Medication non-adherence, MNA, Advances in dispensing containers, Electronic dispensers, Strategies of dispensing

## 1. Introduction

Packaging stands a very important place in pharmaceutical industries. It protects, transport and manages formulation doses. Without packaging, the drug product gets degraded and can't be used for treating the disease. But in this era of living lifestyle only transporting medication safely to the patient is not enough. The need of the current scenario is to improve patient adherence and reduce global cost of prescription non-adherence. So, the packaging system should be like that, that can remind patient about taking medication every time by visual or audible indications. So, the patient cannot skip any medication non-intentionally. Now another problem is, a patient who intentionally skips their medications, they should be handled by different means. That type of patients should be forced to follow their medication through various strategies. This type of medication systems are mainly for patients who forgets to take their medications or mentally challenged and fail to follow their prescription. Majority of the population either forget or skip their medication due to so many various reasons. So that could result in a relapse of disease and patient need to take more medication to cure from that stage of the disease. This would increase the cost of the treatment and ultimately makes the patient suffer more. So, to reduce this kind of events patient need a device which manages the doses and reminds the patient about the time of administration and over watch the activity of patient regarding the medication intake. The other options are to invent a device that can do all the things like a robot to maintain the prescription of the patient and improve prescription adherence of special group of patients.

## 2. Need of the Innovation

The main purpose of this kind of container system is to improve the prescription adherence, which ultimately improves the patient health and reduce the chances of relapse of disease like infections. By completion of the therapy, chances of relapse can decrease, and medication becomes more effective for the short and long-term therapy due to continuous dosing without interruption of any kind. To overcome the problem like prescription non-adherence and overdosing, this kind of medication dispensing systems would be helpful. It also reduces the annual costing used after the patient who fails to follow the dose regimen.

Nowadays peoples are living a very stressful lifestyle which makes them forget about daily medicine regimen

either by mistake or intentionally. Mostly geriatric patients are more prone to skip the dose or take an overdose of the medicine to counter previous skipped dose. Also, a patient with low memory power is more likely to forget about the medication. This type of routine may cost more due to not following the medication properly. According to the data provided by regulatory committees shows the loss of in some billions per year in USA, which ultimately cost the patient more. How to overcome this type of problem and how can we encourage the patients to follow and complete their medication? Answer to this problem should be a system that reminds the patient about the medication. The In current scenario patients are reminded by family members or other caretakers, but this requires so many efforts and after some time it becomes annoying, so it might not end so well, for the patient and also for the caretaker.

## 3. Ideal Dispenser Should Be

The ideal dispensing system should be handy, low power consuming, economic and easily available to all the needy patients. Nowadays there are so many dispensing systems available to fulfil this kind of requirements. The devices or dispensing systems allow the user to set time for medication or prepare a schedule of the medication for a week or a month. The device should be very low power consuming, so it can be operable using button cell power source. The device should not contain any rarely available parts which add up the cost of the device. Thus, it gets available in the market with an affordable costing.

Advancement could be like that, the device might be modified by adding robotic features that can react with patient condition and give proper advice to a patient. Device could be further modified by adding a feature like patient counselling by using previous another patient experience. This type of feature might add-up ultimate cost and that might become a limitation of the device. But on other hand, as a result, the patient can get better use experience from that. So, a higher price might get worthy experience.

## 4. Combination of Automatic Dispenser & Advanced Dispensing Strategies

This could be a revolutionary step toward the health management and improving prescription adherence of patient. This type of management system needs an ANN (Artificial Neural Network) which helps to over watch the

patient activity, can communicate with patients and also remind the patient about the time of medication or even offer medication at the time of administration. This type of system required mini robot which possesses all the functions of dispensers discussed early and also possesses a strategy which makes patient follow their prescription. The robot should be very nice looking and with a very sweet voice by which it interacts with the patient. Other things like animations on the screen can be added to make conversation with robot more interesting. Some device like this are available in the market which can do all this stuff, some popular one is discussed in this section.

1. Mabu or Mabudachi is a Japanese word, which means Best Friend. It is the very correct name for this device because it helps particular group patient to take their medications, talk through their challenges in doing so, and connect them with their pharmacist when beneficial. Mabu isn't mobile but can make eye contact while carrying on a conversation with someone and is capable of simple gestures with her head and eyes. Mabu holds a tablet-like screen in front of her that she uses during conversations to convey additional information. Mabu usually makes eye contact to capture patient's facial emotions and analyse for a better experience in the future. It will help mabu to improve the individual patient experience and to manage patient more nicely. Mabu can talk to the patient, can message or call the patient to remind about the medication and even send a progress report to the pharmacist or physician.
2. Pillo can do all the work which is done by MABU, but in addition pillo can dispense medicine, manage medicine, contact to physician /pharmacist even by video calling using internet connection, make a call to friend, can play radio, inform patient about current day medication plan, can answer any question using internet, can make patient remember about schedules other than daily medication by texting or calling, can communicate with patient with voice recognition technology and give reply to patient questions, in advance patient can discuss problem of disease condition and get proper consultancy from experience database of pillo. Pillo has a camera on the top for video calling and their big screens have a face animation which makes patient comfortable talking to pillo. Below the device, there is a dispensing container which holds the medication, once the medication is dispensed. After getting a reminder of taking medicine, the patient needs to tell to pillo, to dispense medication in the dispensing apparatus. This innovative device also comes with a backup power supply, so whenever there is power cut-off, the patient can get their medication without any interruptions. The only limitation of this device is that it needed to be fixed at one place, so this device cannot travel along patient in long route traveling. Another option of this for home and office is that patient can purchase two devices which can be fully synchronized with each other to share information about patient medication schedule. The patient can

get medication whether he/she is at home or at the office.

## 5. Conclusion

By using mechanisms like above, it is possible to improve the medication non-adherence of patients. Improvement in MNA results into a reduction in drug usage and reduction in cost therapy which ultimately cause a reduction in patient suffering and treatment costing. So, use of these devices and strategies together, one can improve the medication adherence and eventually it results into better health patient/community.

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