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Case Review

Prioterising Patients with Pharma Packaging

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Introduction

User friendly packaging design a challenge for packaging and Polymer Science Technologist. Having gone through market research this has been observed many cases old Ager patient can't able to open the pack and struggling to squeeze the bottle for ophthalmic product and facing difficulties to apply adequate pressure to inject the adequate dose. The most significant way to resolve these issues through packaging innovation. This is only possible through large number of data analysis like how many number of patients used what type of products having complicated packaging device.

Purpose and special role

Solid dose product Packaging

Those patients don't have adequate strength in the figure to apply pressure in the blister pack and takeout tablet/capsule from the specific cavity. Best solution is design bottle pack having most comfortable dispensing system.

Ophthalmic product packaging

Many cases this has been observed ophthalmic bottle wall is very stiff and it's very hard for aged patient to squeeze the bottle and get the aqurate dose. Best solution is to design innovative ophthalmic device.

Injectable product packaging

PFS is most well accepted over vial since application is more convenience for the patient. Gliding force plays a significant role for PFS design success. Auto-injector and injectable PEN specially for insulin.

Transdermal patches

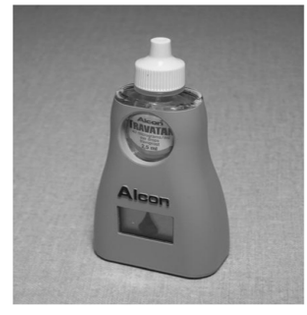
Most important is right kind of polymer and adhesive. Patient/Nurse can take out this material very comfortably. Subject matter expert is a must in order to design best quality Transdermal patches [1,2].

How pharma packaging is helping to solve the patient compliance problem

	Role of packaging
Dosing accuracy by creative Packaging design	Press-to-engage: Most of the Pharmaceutical and FMCG company are using innovative CRP options beyond traditional bottles. These include 'press-to-engage' resalable sliders that are difficult for young children but easy for adults of all ages. Child-resistant blister is another packaging innovation which Adults can takeout tablets/capsules comfortably but not child. Best example of CRP is liquid beakers with bottle-caps that young children can't unscrew. However, not all medication comes in a bottle and new innovations need to be developed to cover all types of packaging.
Drug reminder packaging	Daily and Weekly pillboxes or multidrug punch cards are widely used in everyday practice. It usually consists of a certain number of compartments containing solid oral medication for specific dosing times. Compared to other adherence-enhancing programs, such as patient counselling, education or motivation Drug reminder packaging is a simple technical option and requires little resources on the patient's as well as on the provider's side. The provision of drug reminder packaging aims at enhancing adherence by facilitating medication organization and intake, by decreasing medication errors and by monitoring medication intake.
Affordability	It decreases the capital involved in achieving economies of scale. Instead of going for digital clock attached in the Cap we can go for "Calendar pack" where patient can't able to effort. It enhances flexibility and diminishes the capital needed to attain scope.

Reconstituted medicines	Reconstituted medicines require extra preparation from patients, needing a dilute and solute mixed together to make a liquid. Dry and powdered medicine can be stored for longer, so when they're ready to be consumed they need to be prepared by the patient. The trouble with these medications though, is that the components tend to be mixed in specific measurements to ensure each serving has the right concentration of solute. Problems often arise in measuring and mixing, with patients required to use a syringe or measure servings of dilute to add to the powdered medication. Specialized bottles store a powdered solution in the lid, while an accurate measurement of solute is kept separate in the bottle itself. When the medicine's ready to be prepared, the lid can be pressed down to release the powder and the components can be safely reconstituted.
Accurate and timely doses	If the problem is simply forgetfulness, there are tools available to help patients monitor their doses. "Smart" blister packs are becoming increasingly popular, featuring an incorporated microchip which captures use-related data to monitor when a medicine is being taken and remind patients when the next dose is due.
	Microchip in Blister
Patient reminder systems and asthma medication adherence	One of the most common reasons for medication non-adherence for asthma patients is forgetfulness. Daily medication reminder system interventions in the form of text messages, automated phone calls and audio visual reminder devices can potentially address this problem. The aim of this review was to assess the effectiveness of reminder systems on patient daily asthma medication adherence. Quick Guide to use inhalers Reminder Pack for Asthma Smart Inhalers

Electronic medication packaging devices and medication adherence Different Packaging design options are available for "Physically challenged patient. Not able to apply press too hard. Patient memory loss. Range of Solutions have shown at the right column.	Automatic pill Box Alarm Clock Pill dispenser Automatic Pill Dispenser

	Insulin Patch Pump About the product 4 Tabs/day Pillbox Timer for Pocket or Purse - Alarm Timer reminds you when to take your pills with a Loud Beeping Alarm and Strong Vibrating Alarm. Snooze Feature - Alarms repeat up to Three Times after 4 and 8 minutes. Discreet (silent) vibration alarm is easy to feel when this e-pill Medication Reminder is in your shirt pocket, purse or backpack. Easy To Set - up to 4 Daily Alarms Pocket Alarm Timer. This e-pill Medication Reminder has a long battery life. Switch settings remain set correctly even in a "busy pocket book". Featured on Doctor's TV.
Patient need to apply Eye drop but memory rved(Ophthalmic Product) **Probable questions** Whether drop size would be consistent? What would be the solution for those patients have poor strength in finger? What about Patients are having frequent memory loss?	 **Solutions** Microchip need to put in the bottle. Micro chips need to connect with Mobile, laptop, tabs etc. in order to remind the patient. Patients having poor strength in finger need to press mobile button and proper dose will come out. Digital display system with bip bip sound will work.

Application of 2D Data matrix(To avoid duplication and identification and traceability)	
Application of "Hologram"(in order to Avoid duplication of product)	
Different range of "Tamper "Evident CAP and seal	

	Tamper evident screw and CRC cap (Digital reminder Alarm)
Tamper Evident Seal	
Tamper Evident Carton	

Child Resistance Pouch	
Temper evident Tube	

Reminder Pack for "Auto Injector"(with Microchip) **Solutions** Dose timer will send the reminder to the Patients mobile, Laptop and tabs. Patients will receive massage inform of SMS and video.	Barcoding on Label • Helps to identify the product • Helps to avoid mix up.
Package insert (with Pharmacode) Pharmacode provides product identificationand traceability.	

How Package Design Strategies Can Increase Patient Adherence

How pharma packaging is helping to solve the Patients(Astronauts) in "MicroGravity"(Only few examples for Knowledge).

Bubble formation inside the injectable syringe	Solution: With the help of Electromagnetic induction "Air bubbles "are defused Bubble formation is occurred since "product surface tension is more than the applying force "in microgravity environment.

From “Inhaler” product is not coming out fast.	Solution New design developed which contains “”high pressure” capacity motor which can able to press more compare to the surface tension of the
High radiation and heat in MicroGravity	Gold plated glass vial and syringe can protect heat and radiation in microgravity. Can sustain upto 100 % Rh and temperature between -173 deg,C to 253 Deg.C.

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