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# REPRIMELTS: A NOVEL APPROACH OF THE DRUG DELIVERY

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## ABSTRACT

Reprimelts which is also called as orodispersible pills or mouth dissolving pills or fast dissolving tablets. There are many prominent features, benefits and also the limitations about this reprimelts. There are many challenges to develop reprimelts which include palatability, saturation in water, mechanical strength etc., And the preparation include ingredients, out of all those, superdisintegrants will decides the time span of tablet disintegration. The methods to prepare these pills are freeze drying, cotton candy process, mass extrusion etc., and also there are patented technologies to prepare reprimelts.

**KEYWORDS**: Orodispersible pill, super disintegrant, hygroscopicity, lyophilization, sublimation, cotton candy, orsalov technology.

## INTRODUCTION[1,2,3]

The most common dose form is the pill now in use owing to its ease of administering oneself, compactness, simple manufacture. Elderly, young, and mentally ill patients have trouble swallowing regular pills, which results in low patient compliance. For instance, an extremely elderly patient may be incapable of swallowing an antidepressant dose every day. Antihistamine syrup may not be the most practical dosing form for eight-year-old allergic child. An institutionalized schizophrenic patient can smear a regular tablet under their tongue to skip their daily dose of an atypical antipsychotic. An elderly woman receiving radiation treatment for breast cancer could feel too queasy to take her H2-blocker.

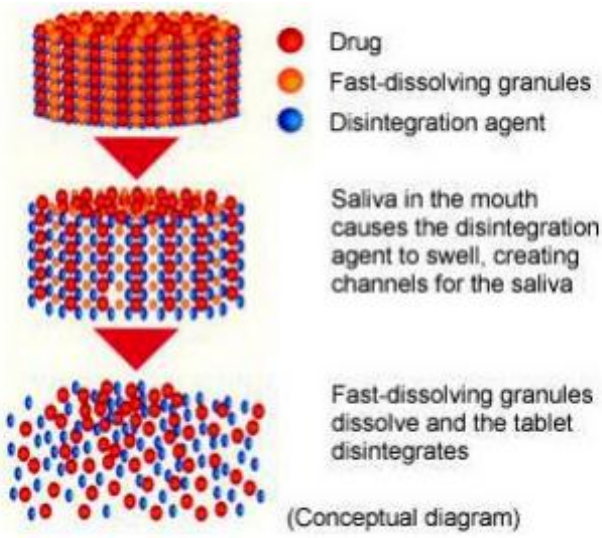
Reprimelts are a novel medicine delivery technique that scientists have created to solve these issues. These reprimelts which is also called as orodispersible pills or tablet, porous pills, fast dissolving tablet, melt in mouth. A reprimelt is an oral solid dosage form that, after being

placed on the tongue, rapidly dissolves, releases the drug. The medication then dissolves or disperses in the saliva and is subsequently absorbed. As saliva descends into the stomach, some medications are absorbed from the oral cavity, pharyngeal, oesophageal tissues.

These tablets release the active ingredient after coming into contact with saliva, resulting in the highest drug bioavailability possible when compared to conventional dose forms. Super disintegrants, which release the medicine in the mouth and increase bioavailability, are added to the dose form to provide this dispersible feature.

**Mechanism**[4]

A drug's bioavailability is determined by its absorption, which is influenced by its solubility and permeability in gastrointestinal fluid and across its membrane. A drug's solubility mostly based on its physiochemical characteristics. The rate at which the tablet dissolves has a substantial effect on the rate of medication absorption. The disintegration process, which separates the medicine's component particles before the drug dissolves, is brought on by excipients known as disintegrants. Disintegrants are a crucial ingredient in the formulation of tablets; they are consistently added to tablets to promote tablet breakage when they come into contact with aqueous fluid.




**Requirements of Reprimelt Tablet**

**Ideally it should**[5,6]

- No bitter taste; A dose of less than 20 mg; and a molecular weight of between small and moderate.
- Excellent stability in saliva and water.

- pH of the oral cavity that is partially non-ionized.
- Possibility of diffusing and partitioning into the overlying GIT epithelium.
- potentiality to penetrate oral mucous membranes.
- Don't need water to be administered orally and dissolve, scatter, or in a matter of seconds, they disintegrate in the mouth.
- Provide pleasant mouthfeel.
- Possess a good taste-masking ability.
- Be tougher and less supple.

**Prominent Feature of Reprimelts[7,8]**

- The medicine will dissolve and absorb quickly, leading to an immediate start of the activity.
- By minimising side effects brought on by a dosage reduction, pre-gastric absorption can improve bioavailability and clinical performance.
- By preventing physical obstruction during oral administration of the standard formulation, the risk of choking or asphyxia is reduced, improving safety.
- New business opportunities including life cycle management, product differentiation, and product promotion.
- Helpful in situations where an ultra-rapid response is required, such as motion sickness, acute allergy attacks, or coughing.

**Benefits of Reprimelt Tablets[9,10]**

- Longer-lasting stability because the medicine stays in solid dose form until it is taken. So it combines the stability benefits of solid dose forms with the bioavailability benefits of liquid dosage forms.
- Provides more precise dosage than liquids
- Measurement-free, which eliminates a crucial flaw with liquids.

**Limitations of Reprimelts[11,12]**

- The mechanical strength of tablets is one of the main drawbacks of reprimelts.
- Reprimelts are metrics that are soft and porous, or they are crushed into tablets with little compression, which makes them fragile and challenging to handle.
- Drugs with unpleasant tastes are challenging to develop as Reprimelts; great care must be taken when formulating such a kind of medicine.

- People who have a dry mouth as a result of less salivation aren't necessarily the best choices for these pill formulations.
- Frequent dosage and a minimal half-life.
- Needed a controlled or prolonged release.

**Challenges to develop Reprimelt/ fast Dissolving Tablet/ mouth Dissolving Tablet/ Oro dispersible Tablet**

**Palatability**[13,14]

FDTs typically accommadate the medication in a flavour-masked form since the majority of medications are indigestible. After administration, FDTs break down or the active ingredients that come into contact with the taste buds to dissolve in the patient's mouth. Thus, patient compliance depends on hiding the flavour of the drugs. Techniques for masking flavour include using lipophilic vehicles, coating with polymers, complexing carbohydrates, lipids, or proteins with cyclodextrins or ion-exchange resins, making salt, using salting-out layers, and using solid dispersions.

**Mechanical strength and disintegration time**[15]

FDTs are frequently need to have specialised peel-off blister packaging, which could raise the price, because they are frequently made of an extremely porous and soft-molded matrix or are compressed into tablets with very little effort. Wow Tab and Durasolv are the only technologies capable of producing tablets that are robust and resilient enough to be placed in multi-dose bottles.

**Hygroscopicity**[16]

Several hygroscopic orally disintegrating dosage formulations are incapable of maintaining physical integrity in the presence of ambient temperature and humidity. As a result, they require humidity protection, This calls for specific product packaging.

**Dose of the medication**[17]

The dose of medication that can be incorporated into each unit dose restricts the deployment of ODT technology. The medication dose must be under 400 mg for insoluble pharmaceuticals and less than 60 mg for soluble drugs for lyophilized dosage forms. It can be difficult to formulate oral films or wafers with this feature that dissolve quickly.

**Saturation in water**[18]

Due to the production of eutectic mixtures in water-soluble pharmaceuticals that lower their freezing point and produce a glassy substance that might crumble once dried since the sublimation process caused it to lose its supporting structure, these substances provide a variety of formulation issues. The use of certain excipients that form matrices, like mannitol, that can cause crystalline and thus add inflexibility to the product, can occasionally prevent such falls to the amorphous combination.

**Tablet size**[19]

The ease of administering a pill is influenced by its size. The most accessible size of tablet to handle is one in excess of 8 mm, whereas easiest size to ingest is 7-8 mm. Consequently, it is challenging to create tablets that are both easy to grasp and easy to swallow.

**Mouth sensation**[20,21]

within the mouth, Reprimelts shouldn't splinter into more substantial pieces. The particles that are produced after the Reprimelts disintegrate ought to be as small as possible. Additionally, the oral feel is improved by the inclusion of tastes and cooling substances like menthol. FDTs need should display little emotion in response to their surroundings.

**Excipients utilized in Reprimelts include**

A super disintegrant, a diluent/bulking agent, surface-active agents, lubricant, if desired, swelling agent, as well as sweeteners and flavorings.

**The most crucial components of Reprimelts/mouth-dissolving tablets out of all these excipients are**[22,23,24]

**Super disintegrants**

The fundamental method is the usage of disintegrants is involved in the creation of MDTs. Disintegrants have a significant impact on how MDT breaks down and dissolves. To achieve High rates of dissolution and rapid disintegration, it is crucial to choose an appropriate disintegrant in the ideal concentration.

**Super disintegrant selection**

Although super disintegrants mostly impact disintegration rate, when utilised at excessive doses they can be negatively impacted to, tablet hardness, friability and mouthfeel. Therefore,

a number of desirable criteria that should be taken into account when choosing a suitable super disintegrant for a given formulation include:

- An oral cavity or mouth where a tablet comes into contact with saliva, they quickly disintegrate.
- Be able to make tablets that are less brittle by being compact.
- Give patients a positive mouth feeling experience. Small particle sizes are therefore selected to ensure patient compliance.
- Flow well, as this enhances the whole blend's flow properties.

**Reprimelts can be produced using a variety of methods, including**

**Freeze drying**[25,26]

The lyophilized or freeze-dried tablets have a particularly porous character and melt or fall apart quickly when they got exposed to saliva. After freezing the product, water is sublimated from it in this procedure. The substance is first chilled to lower than its eutectic point. The dried product is next subjected to primary drying to reduce the moisture content to approximately 4% w/w. To achieve the desired level of bound moisture, secondary drying is then performed. Bulking agent and occasionally drug gain glossy amorphous structure as a result of lyophilization, which improves solubility. The matrix network is partially collapsed and vacuum dried above the temperature at which the matrix collapses and it is a part of tablet that quickly dissolves in aqueous solution. Below the matrix's equilibrium freezing point, the matrix is partially dry. Vacuum drying the tablet above its collapse temperature, as opposed to freeze drying below it, produces tablets with increased structural integrity while quickly dissolving in average amounts of saliva. However, the high expense of processing and equipment limits the usage of freeze-drying. Lack of physical resistance in typical blister packets is one of the final dose forms' other significant drawbacks.

**Moulding**[27,28,29]

Moulded tablets have a porous construction that speeds up dissolution and makes it simple to dissolve them. Because water soluble sugar is incorporated in the dispersion matrix of moulded tablets, the taste is enhanced. Depending on the technique used for preparation, moulding can be categorised:-

**Compression method**: This process entails preparing a wet mass by spritzing a hydroalcohol solvent onto the powder mixture, It is then compacted in mould plates at low pressure to produce a better mass. The solvent is subsequently eliminated by air drying. The pills made

in this way have a porous structure that speeds up disintegration and dissolving and are less compact than compressed tablets.

**Heat Moulding:** The molten material containing the dissolved or dispersed medication is settled to create the tablet using the heat moulding technique. The suspension or solution of the medicine, the binding agent, and the sugar is created during this process, and it is ultimately poured into the moulds. Then, this mixture is allowed to solidify at ambient temperature to create a gel, which is then dried under vacuum at 30 °C for solidification.

**Direct compression**

The simplest method for creating tablets, especially for manufacturing ODT on a big scale, is direct compression. Super disintegrants including crospovidone, croscarmellose, alginic acid, and calcium silicate are used in this procedure. Tramadol hydrochloride OTDs have been made using the direct compression approach. Tramadol hydrochloride taste-masked granules are first created using the mass extrusion process of Eudragit E100, and then Super disintegrants like crospovidone, Ac-Di-Sol, and sodium starch glycolate are used to make OTDs. In this approach, the quick commencement of action led to a reduction in postoperative pain.

**Cotton candy process**[30]

By Flash melting and spinning at the same time, a matrix of polysaccharide/saccharide is created in this technique. The created matrix is then combined with various excipients and active components before being crushed to create MDTs. Fuisz's FLASHDOSE is one of the patented technologies used in this process. They have used this method to manufacture ibuprofen as MDTs.

**Spray drying**[31,32]

A extremely porous and fine powder is produced when an aqueous mixture with a support matrix and other ingredients is spray dried. After that, the active component is combined with this, and the tablet is compacted. Using this method, Allen and Wang23 created mouth-dissolving pills that vanished in under 20 seconds. The formulations included croscarmellose as a disintegrant, mannitol as a bulking ingredient, and using gelatin that has been both hydrolyzed and not as a supportive ingredient for the matrix. The addition of an alkali increased dissolution and disintegration. (for example, sodium bicarbonate) or an acid (for example, citric acid). By spray drying the aforementioned mixture that was then compacted

into tablets, the porous powder was produced. This process produces tablets with a disintegration period in an aqueous solution of less than 20 seconds.

**Sublimation**[33]

High porosity MDTs have been created by the sublimation process. The volatile chemicals and other excipients are compressed into tablets, along with other substances, to create a porous matrix, which is then sublimated. This has been accomplished by using non reactive solid substances with high volatility, such as ammonium carbonate, benzoic acid, camphor, naphthalene, urea, and urethene. The creation of the matrix's porosity was also suggested using solvents like cyclohexane and benzene.

**Mass extrusion**[34]

Using a solvent mixture of methanol and water-soluble polyethylene glycol, the active blend is softened in this procedure. The softened mass is then expelled through a syringe or extruder, where it is divided into even segments by a heated blade to produce tablets**.**

**Nanonozation**[35]

Through the use of a patented wet-milling procedure, a recently developed Nano melt technology reduces drug particle size to nano size. By surface adsorption on particular stabilisers, the drug's nano crystals are protected from aggregation and added to FDTs. This method is particularly helpful for minimally water-soluble medicines. Another benefit of by using this technique is that nanoparticles dissolve quickly, increasing absorption, bioavailability, and dosage reduction.

**Patented technologies**[36,37]

**Orasolv technology**

It's the first fast-dissolving formulation created by CIMA lab. To reduce oral disintegration and dissolve time, tablets are manufactured via direct compression at low compression force. Due to the action of effervescent agents, the active medications are taste-masked and disseminated in saliva. It gives the patient's mouth a pleasant sensation. The lack of mechanical strength in Orasolv technology is one of its main drawbacks. The generated tablets need to be put in specifically created packs because they are soft and friable.

**Flash dose technology**

This method is centred on the creation of floss, a sugar-based matrix formed from a variety of excipients that may be used alone or in combination with other medications. A large range of oral disintegrating products are currently being prepared using two platform fuisz technologies named Shea form or Ceform. Flash dosage tablets are made of "Floss," a self-binding shear form matrix. Flash heat processing is used to create shear form matrices.

**Flash tab technology**

This method creates tablets with microcrystals as their active ingredients. The traditional methods of coacervation, microencapsulation, and extrusion spheronization can be used to create drug micro granules. The entire processing was done using standard tableting technology.

## CONCLUSION

Reprimelts, which are the novel approach of drug delivery in which the medications can be released within in a span of minutes and it is best choice for the patients, due to its ease of administration and also its fast dissolving nature and also it is the primary choice of the physician to the patients irrespective of their age. So, these are the best choice for the safe delivery of drug.

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