

### Problems to Address

- The number one problem that the TrueYou transdermal patch must address is pregnancy prevention.
- The TrueYou patch must reduce the amount of norelgestromin (NGMN) and ethinylestradiol (EE) to combat the issue of blood clotting and liver disease in current transdermal patch use.
- Contact dermatitis effects many who attempt to utilize the benefits of a transdermal birth control patch, making it difficult to sustain long term usage of the patch.
- Current on market transdermal patches are always made to be the same generic white skin tone, making it hard for people of other skin tones to keep usage of the patch discrete.
- Transdermal patches tend to stick well to some users and much less well to others. Since the patches are made to stick for a week at a time, the adhesive can be hard to remove from the skin or just fall off due to excess sweat or showering.

# TrueYou

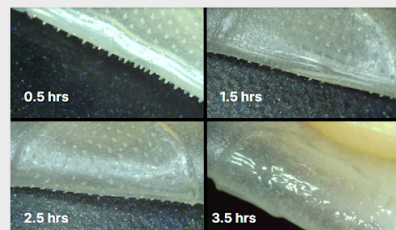
## A Transdermal Patch Revolution



### Dissolving Characteristics

An alpha prototype was generated to effectively test the dissolving rate of commercially available dissolving microneedles with similar compositions to the PLGA microneedles proposed in the TrueYou design concepts. This prototype was to show that the microneedles would dissolve in the recommended time to show the efficacy of the patches for our use.

As shown in the images below, the dissolving microneedles with a hyaluronic acid composition began dissolving almost immediately with the needles showing deformation by 1.5 hours of use and fully dissolving by 3.5 hours.

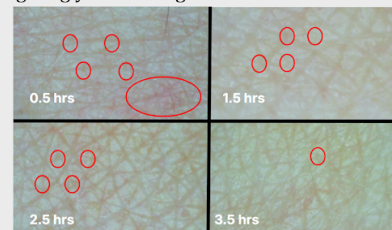


### Healing Timeline

Another alpha prototype was generated to show how the needles puncture and irritate the skin. This prototype informed how the adhesive was affecting the skin as far as contact dermatitis since two of three participants have an allergy to most adhesives as well as show how the punctures would heal over.

The images below show the initial removal of the dissolving microneedle patches after a half hour showed a fair amount of irritation to the skin. However, as time passed, the irritation quickly subsided and healed over by four hours.

Anecdotal observations included that "the application of the microneedle patches felt like a cat giving you a strong lick."



### Solutions

- TrueYou uses a dosage of 4.6mg of NGMN and 0.3mg of EE in order to assure that pregnancy prevention is addressed and assured throughout the life of the patch.
- The use of dissolving microneedles in the TrueYou patch causes NGMN and EE to be delivered directly into the body, bypassing the epidermis, allowing for more bioavailability and a much smaller dosage of NGMN and EE in each patch to reduce issues of blood clotting and liver disease.
- A hypoallergenic adhesive is being used to safely secure the TrueYou patch to users. In addition, the microneedles require the patch to be on much shorter than current designs, causing the adhesive to only be connected for the recommended six hours.
- The TrueYou patch uses a dyeable hemp fabric backing in order to address a couple concerns with inclusivity. Since the hemp is dyeable, the color can be changed to better match a wider range of skin tones. The hemp fabric is a more biodegradable fabric in comparison to the plastic backings currently used, allowing for a more eco-friendly disposal.



		Imp.	Xulane	NuVa Ring	The Pill	IUD	Injection
1	Prevents pregnancy	5	****	**	***	***	**
2	Biodegradable	3	*	.	***	*	***
3	Private/Discrete/Accessible	4	.	****	****	****	****
4	Convenient/User Friendly	5	***	**	**	*	***
5	Easy to store/Long shelf life	2	***	***	***	.	.
6	Side effects easily treated	4	*	.	**	*	.
7	Can be used to skip period	1	****	****	****	***	**
8	Non-invasive	4	***	***	***	*	*
9	Inexpensive	4	*	.	**	*	.
10	Sweat/Activity Friendly	2	*	***	****	****	****