



The Universe of Pre-filled Syringes & Injection Devices

## Pre-conference Workshop

**6 November 2017**

Vienna | Austria



# Why Make Your Existing Auto-Injector Smart?

*Brian Lynch*

*West Pharmaceutical Services*

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## Today We'll Share Some Recent Research ...

Do Patients Want to Connect  
Their Injection Device?

Why?

Would They Be Willing to “Augment”  
their current auto-injector with an  
incremental device?

Does this additional device  
fit into their lifestyle?

Are there Form Factor  
preferences for these  
devices?



# Adherence Impact on the Healthcare Ecosystem

Medication Adherence affects all the “P”s



P<sub>harma</sub>



P<sub>atients</sub>



P<sub>roviders</sub>



P<sub>ayers</sub>



P<sub>harmacy</sub>

And in aggregate



P<sub>opulation Health</sub>



## The Costs and Impact are Well Documented . . .

**\$637 Billion**

Pharma's Lost Revenue

Estimated Annual Pharmaceutical Revenue Loss  
Due to Medication Non-Adherence, Capgemini,  
December, 2016

**125,000**

Patient deaths in the US per year  
linked to medication non-adherence

Medication Adherence: Helping Patients Take Their Medicines As Directed  
[Regina M. Benjamin](#), MD, MBA

**75%**

Of Americans don't take  
medications as directed

National Consumer League

**>1/3**

Of medication-related hospital  
admissions are linked to poor adherence

National Consumer League





## Changing . . . And Dialing Up the Conversation

### Why Medication Adherence Needs to Be a National Priority . . .


*For all the dizzying talk of repeal versus repair, one of the greatest cost drivers in healthcare is still hiding in plain sight. It's called medication nonadherence: the simple fact that people often don't take their medicines as prescribed. . . People who don't take their medicines are more likely to end up back in the hospital or in the emergency room than those who do*



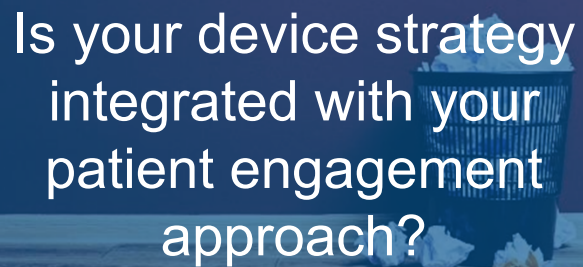
*[Forbes: Why Medication Adherence Needs to Be A National Priority](#) By: Hayden Bosworth, Professor, Duke University Medical Center; and Sloane Salzburg, executive director, Prescriptions for a Healthy America June 12, 2017*

You recognize  
**the problem,**  
  
your patients  
**need your help**  
  
and you want  
**to give it to them**





You have some options,  
but are they engaging?

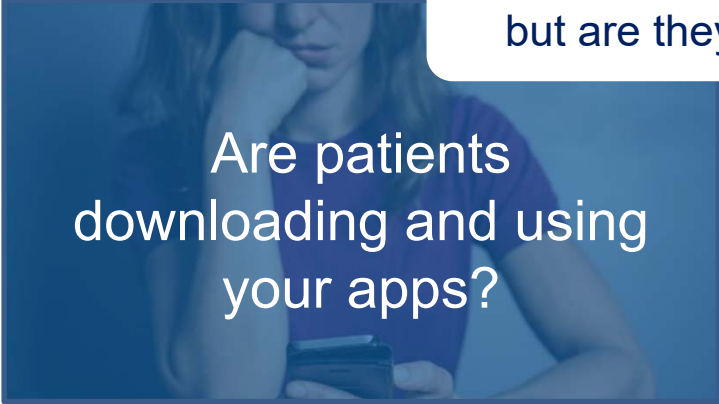


Is your device strategy  
integrated with your  
patient engagement  
approach?




Is your email / CRM  
platform effective?

You have some options,  
but are they engaging?



Are patients  
downloading and using  
your apps?



Do your patients have  
the right training  
tools?



With the widely recognized burden of  
poor medication adherence . . .

Solutions are emerging that are  
focused on motivating patients

## And Help Them Along Their Care Continuum

Self Injection



Training

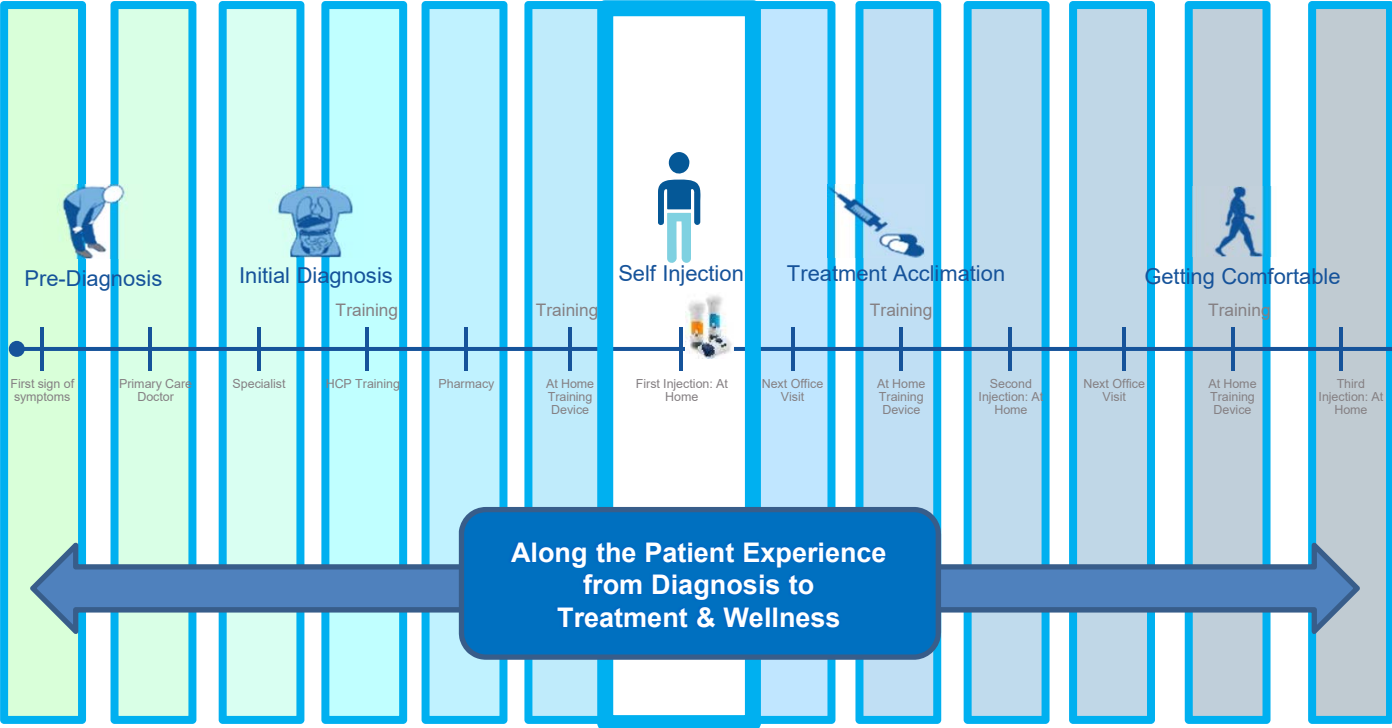
Training

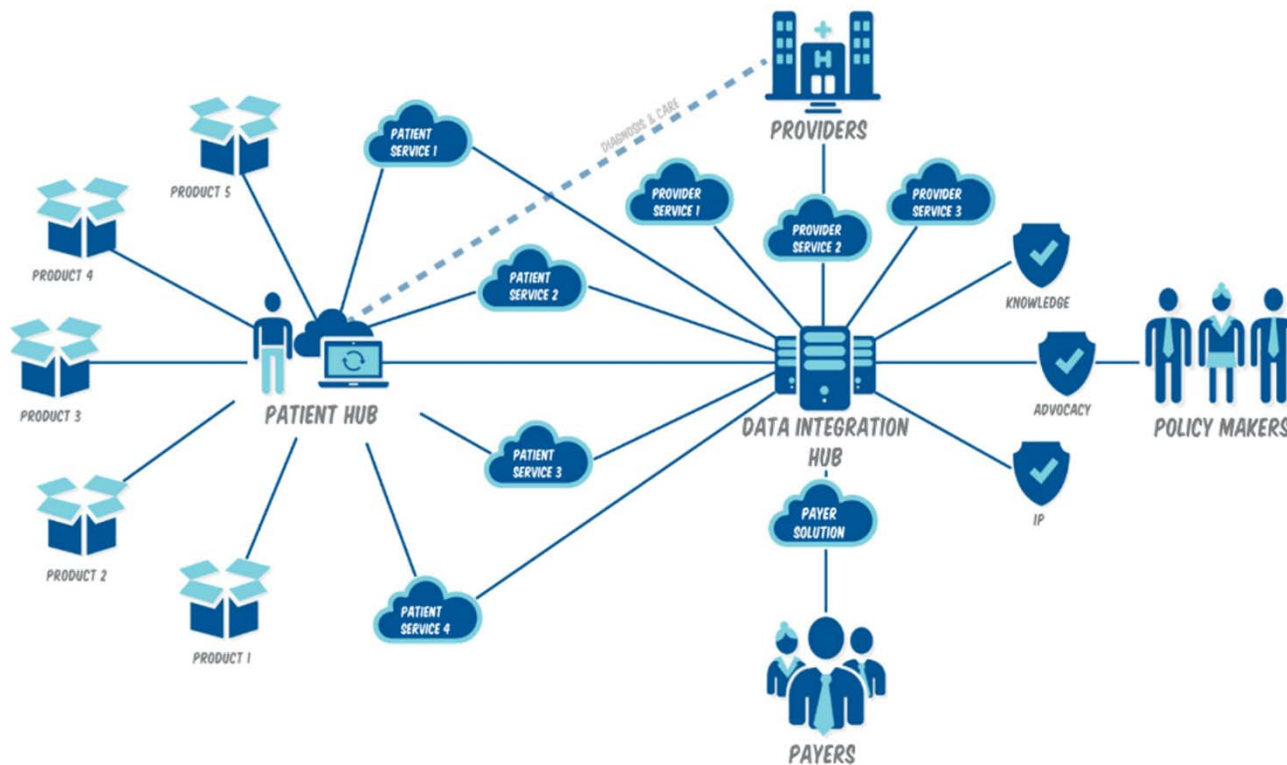
At Home Training Device

First Injection: At Home

At Home Training Device

# Opportunities to “Help” Exist





While at the same time providing opportunity to touch, and add value, to more stakeholders in the healthcare infrastructure.





Within the **digital ecosystem**,  
opportunities exist to improve the *patient*  
*experience* from **injector** to **outcome** by

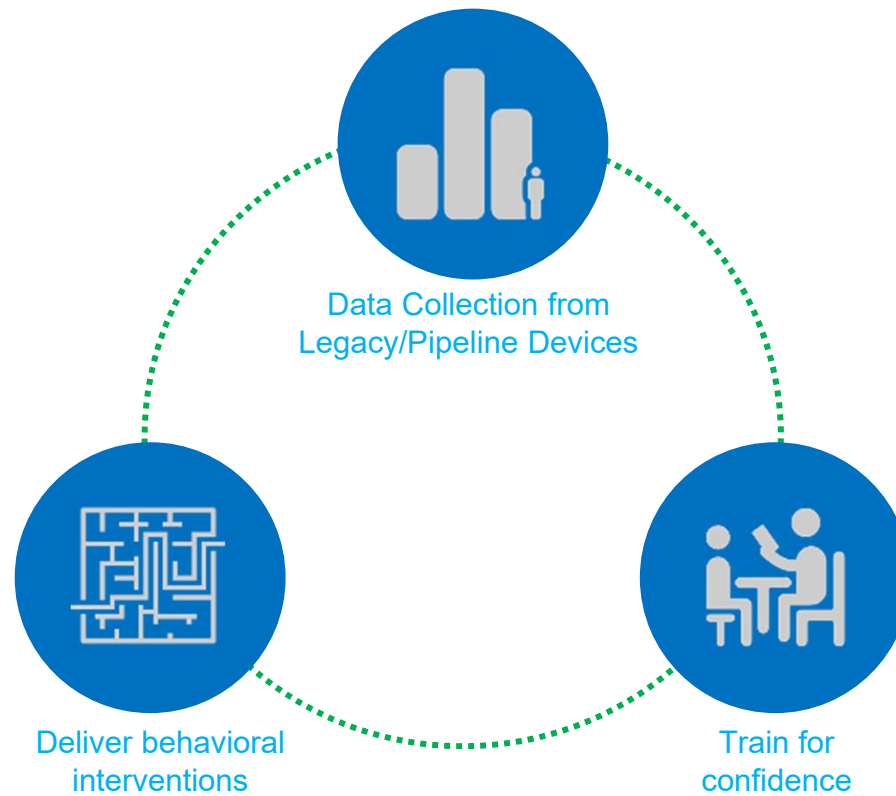
Making elegant, easy-to-use devices backed by user research

Providing confidence building training tools

Integrating both of these into a platform that uses proven  
behavioral science approaches to engage and motivate

West, joined together with leaders in medication delivery solutions and training systems, to improve patient adherence, health outcomes, and the overall experience







## Deliver Behavioral Intervention

How Does HealthPrize Work?

Patients are people – it is about **activating the engagement mechanisms** that make people, people.

### Ways to “Earn”

- Caregiver notices
- HCP portal
- Quizzes
- Surveys
- Daily Tips
- Leaderboard
- Weekly drawings
- Reminders



### Ways to “Spend”

- Reward Mall
- Gift Cards
- Charitable donations

Driving Adherence by Leveraging the Principles of Game Dynamics, Behavioral Economics, and Consumer Marketing Concepts to Drive Engagement, Education and Motivation

## HealthPrize Impact on Adherence

### Engagement

4.6

Average number of weekly visits

2:10

Average minutes of each visit

38

Average engagement time per month

### Education

73%

Believed learning about their condition helped them better adhere to their medication

73% of all program enrollees  
\*COPD inhaler program

95%

Increased their understanding of how their blood vessels work

95% of all program enrollees  
\*Hypertension program

97%

Did they learn about diabetes from the program, with 74% reporting they learned a lot

97% of all program enrollees  
\*Diabetes program

### Motivation

52%

Mean adherence lift for all HealthPrize programs

92%

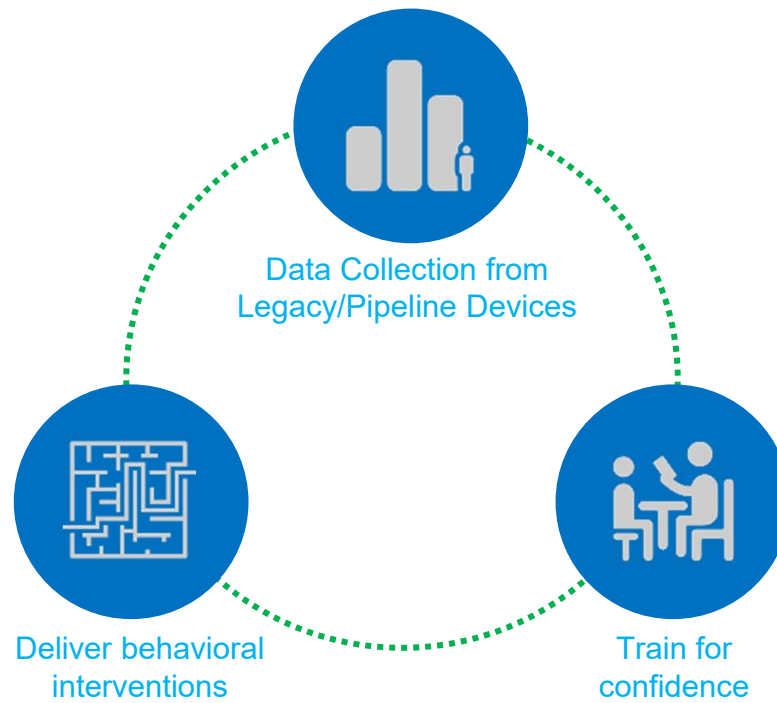
Average reduction in gap days with no medication on hand

15%

Rate of enrollees who were re-activations of discontinued Rx

\*COPD inhaler program

All data provided by HealthPrize Technologies





## Train For Confidence



### Smart Trainers

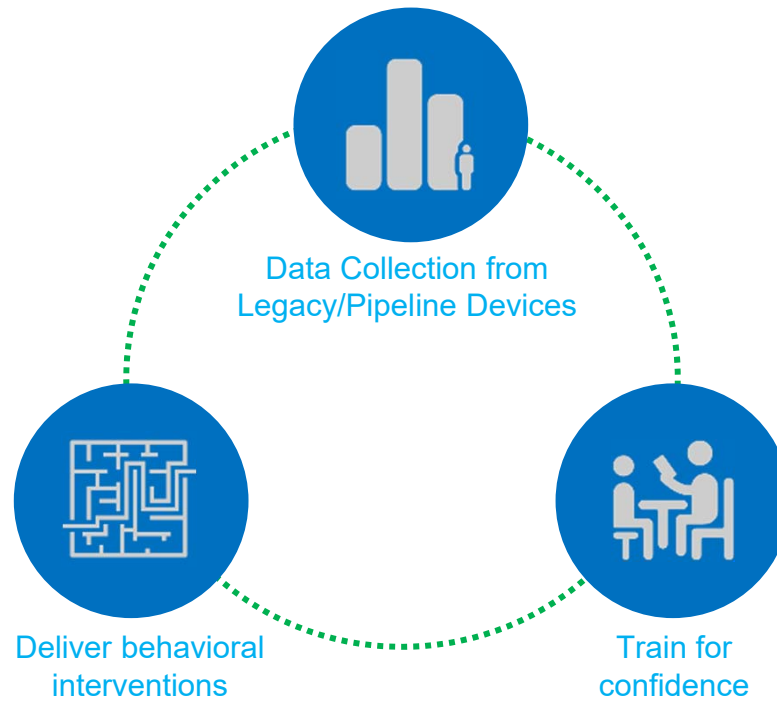
West and Noble have partnered to develop a smart trainer system that walks patients through proper device use, and senses that patients have performed steps correctly.



### Interactive Learning

For some user populations, virtual training may be desirable. West's interactive learning platform assists pharma in training patients for proper device use

**Both can be linked to the HealthPrize platform to reward the training and reinforcement of proper device use.**





# Data Collection from Legacy/Pipeline Devices



West gives pharma multiple ways for their patients to communicate adherence data

## Passive



### Connector for Existing Device

Patients use an electronic device that is separate from the injector. This device passively captures the data and sends it to the HealthPrize platform.



### New Device with Connectivity

Patients use an electronic device that has connectivity built in from the ground up. This device passively captures the data and sends it the HealthPrize platform.

## Active



### Self Reporting Directly in App

Patients report does completion directly in the platform with the added behavioral coaching of the HealthPrize platform.



### Barcode or Image Scanning

Patient can simply scan the device or the barcode. The drug is verified as authentic and administration is recorded in HealthPrize.



Connector for  
Existing Device

## Connecting Legacy Injection Devices. Understanding Emerging Solutions

Solutions are emerging that  
offer **lifecycle opportunities** to  
connect *marketed legacy* drugs  
in their **current device**  
packaging



Solutions are emerging that offer **lifecycle opportunities** to connect *marketed legacy* drugs in their **current device** packaging



## Let's see what the user might think about adopting these

Solutions are emerging that offer **lifecycle opportunities** to connect *marketed legacy* drugs in their **current device** packaging

Do Users Want to  
Connect Their Injection  
Device?

Why?

Would They Be Willing to “Augment”  
their current auto-injector with an  
incremental device . . . and some added  
steps?

Does this additional device  
fit into a user's lifestyle?

Are there Form Factor  
preferences for these devices?

West selected Noble's technology to allow West's injection assistant devices to connect to the patient engagement ecosystem, allowing legacy devices to be "smart".



West conducted research to better understand the user experience and acceptance of these devices.

*. The devices shown in the presentation are prototypes only.  
U.S. Patent No. 9,767,708*

## Injection Assist User Evaluation

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## Injection Assist User Evaluation



### Study Objectives

- Determine which aspects of a “smart” device are meaningful to patients and why
- Understand which form factor patients prefer and why
- Understand how a “smart” device will fit into the patients’ existing routines

# Materials and Methods

## The Reason for Connected Devices

All respondents were shown a short video, The Reason for Connected Devices\*, prior to seeing the model devices. The purpose of this video was to establish an understanding for why such a different type of device would be needed, what features the app could have, and what benefits they would serve, decoupled from the device itself:



Participants were introduced to the accessories in a random order. At the introduction of Clip On A and Base, they viewed a video that presented the device and how it works in a consistent fashion. They were informed that Clip On B functioned the same way as Clip On A:



Clip-on A



Clip-on B



Base



# Materials and Methods

This research leveraged an on-line ethnographic tool

## Online Modules

Participants were asked to respond to a variety of probes, including:

- Attitudes, goals, and motivations
- Current injection practices
- Connected devices and models
- Device fit in lifestyle

## Video Perspective

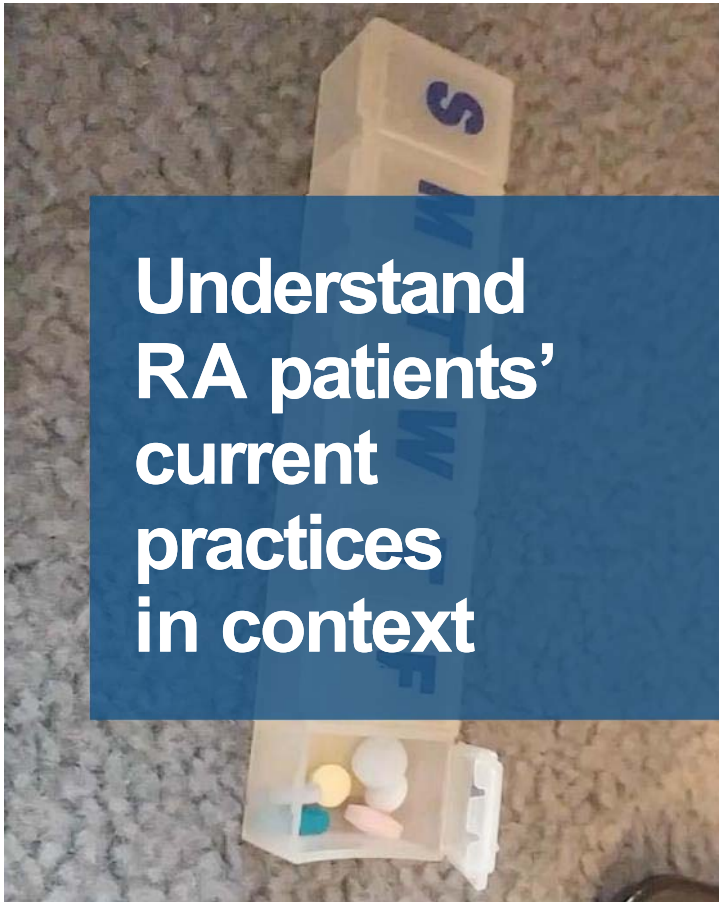
Participants used their smart phones to make and submit videos through a mobile app. The videos enabled them to provide more detail and context to their written responses. We asked them for videos of:

- Their medications and when they take them
- Their injection routine from start to finish
- Them using the model devices and how they felt using it
- Their relative rankings of the devices and why they ranked them in that way

## Photo Perspective

Participants used their smart phones to take photos through a mobile app. They were instructed to not include any personal information in their photos.\* We asked them for photos of:

- Where they store their medications
- Where they would store an accessory device
- Where they would charge an accessory device
- Where they store their auto-injector when they travel



## Understand RA patients' current practices in context

noble™



### Patients showed us unfiltered views of their current practices, providing insights to how a smart device could fit in

- 1. Current Medications:** Participants provided a window to storage practices and insights to the complexities of managing their disease
- 2. Current Injection Process – Preparation, Administration, Disposal:** Patients share their rituals of getting ready to take their injections, how they inject, and where they dispose of their autoinjectors
- 3. Changes in routine and current injection:**
  - Changes to routine impact normal injection practices
  - Given the chance to change something about their current injection experience, participants shared their views, not all about the pain

West 



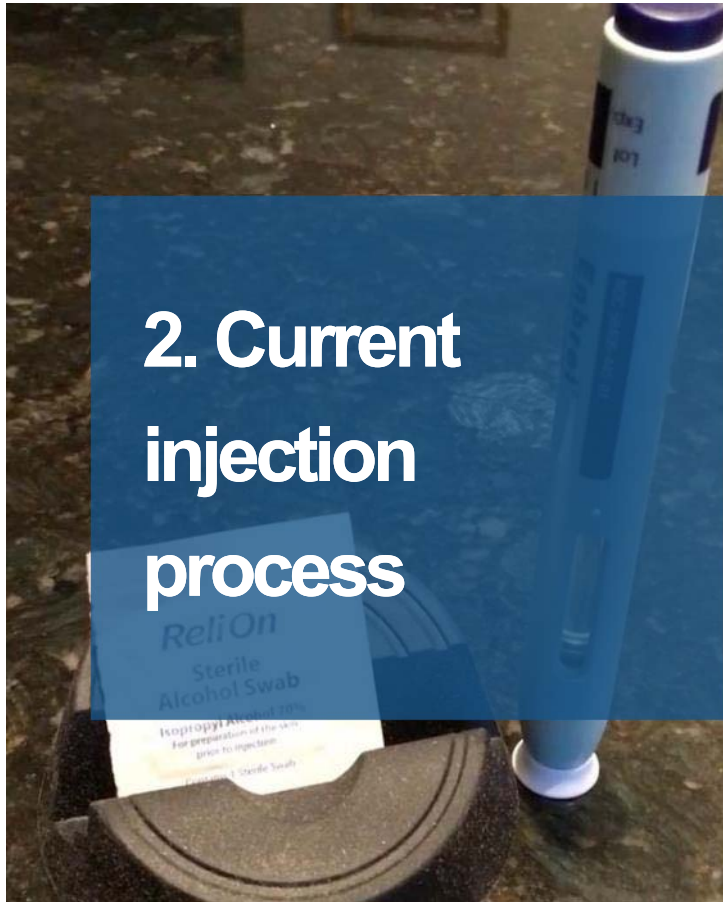
noble™



## Participants reveal the messy reality and complexity of managing their disease

- Storing medications and accessories is a messy business
- RA patients have other conditions too, some related to auto immune disease and some due to age
- RA patients take more than a shot and dosing regimens can get complex
- Therefore, many participants use reminders and tracking systems
- These systems are not fool proof and patients still miss doses for a variety of reasons

West 



## 2. Current injection process

noble<sup>®</sup>



### Preparation

- A large focus of preparation is to reduce injection pain
- Variability in medication warming time contribute to wide ranges in injection process time
- Participants begin anticipating the injection during preparation

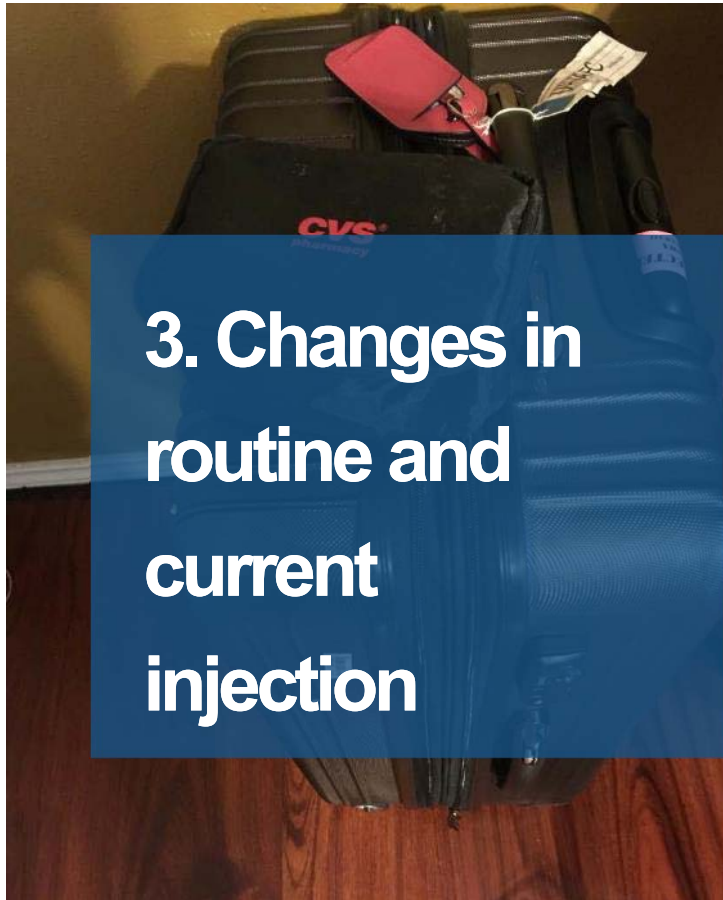
### Administration

- Participants varied in their injection site selection and techniques
- Patients may require help, especially during a flare
- Most find the injection painful
- Injections induce a feeling of anxiety; however, they are a means to feeling better

### Disposal

- They keep containers throughout their homes
- Disposing of containers is varied and not straightforward; sometimes, patients need an interim solution





### 3. Changes in routine and current injection



#### Changes to routine impact normal injection practices

- Travel adds challenges for patients
- Packing practices for injectable medications vary

#### When asked what they wished they could change about their injection experience, participants views were not all about pain or the needle

- Reduce pain
- Make it quieter
- Eliminate refrigeration
- Reduce dosing frequency
- Make it faster
- Do it without help



## Understanding reactions to a connected concept

- Participants were introduced to a connected concept via video, delinked from specific device solutions
- Participants were provided low fidelity sketches to explain potential functionality
- In this way, we obtained feedback to the overall concept without bias by prototype
- Next, users watched videos of working models and handled low fidelity models to show use cases and provide preference





## Reactions to a connected system

Overall, participants reacted favorably to a connected system and specific app features

1. 12 out of 19 participants would switch to a connected system because it empowers and engages them positively
2. Those who would not switch were concerned with potential errors in the process or didn't see the need
3. Participants saw the most value in medication reminders, refill reminders, notification of malfunction, rewards, and tracking
4. Participants had questions about specific features and recommendations of additional ones

## Reactions to a Connected System

### Patients want to feel in control and know they performed their injection correctly

"This would make me feel more in control in managing my disease. I would feel like I am doing everything possible to keep on top of my RA."

 RA09 New

"I like that it can tell you if something went wrong."

 RA02 Experienced

"I know it works and it is easy. I have no anxieties about using it."

 RA08 Experienced

"I would use a reusable accessory device because it would keep me on track."

 RA14 Naïve

### Managing RA takes time and the participants appreciated that the app could help them increase efficiency

"To me this would be a time saver... everything that I need in one spot, available with just one click of a button."

 RA09 New

"It would make my life easier by saving me time. It would handle things that seem insignificant but in reality many things need to be done during business hours...while the actual task may be a quick one, there is usually wait times and holds during the call." (automatic refills)

 RA04 New

### Some participants felt the technology was "with it" and viewed it positively

"Finally something that matches the real world!!"

 RA22 New

"...very innovative in patient care. I've never been presented with such devices and options."

 RA14 Naïve

"Good idea and modern technology."

 RA26 Naïve



## Reactions to a Connected System

After learning about the app features and seeing all the devices, we asked participants to write a breakup letter to their current device if they would switch to a connected system or a thanks but no thanks letter if they would not switch to a connected system

### RA15: Reminders and other benefits

To: Research Department Enbrel

I have been involved in a study worthy of your consideration. Attaching a small (short) clip onto the existing injectors that are mailed to customers would have the ability to remind customers of the day to take the medicine; allow (simplify) the renewal process and offers additional benefits to those with RA.

There would be no modification to the sure- click.

The clip works with an app on any apple or android device.

### RA12: More capabilities than current injector

Dear Auto-injector,

It's not you, it's me. I want you to know that you have been amazing getting to this point. You have never put up a fight or made it difficult for me when meeting each week. I believe in growth in everything that I do and every relationship that I have and I think we have gone as far as we can together. I need more than you are able to offer right now. I need to know when you are not feeling your greatest and can't give me all that I need from you that day. I need to be reminded sometimes that we need to meet. I also need to be able to see how long we've been meeting and times where it may have been impossible to meet. I know that's there's someone who will appreciate all that you can do for them and I wish you nothing but the best.

### RA05: More technologically advanced

Dear current autoinjector,

I know you've been lonely and bored over the past 6 years. All this technology happening around you and you're just a simple country girl! Well now's your chance to join the ranks of advanced technological innovations. Welcome to your new friend--the smart pen. This clip on device will allow you to monitor and track injections more effectively and help me earn rewards when I'm on schedule. With this device I will never need to remember when to inject or to call to refill. This doesn't replace you--it enhances you. I hope you enjoy your new friend as much as I will.



## Reactions to specific device options

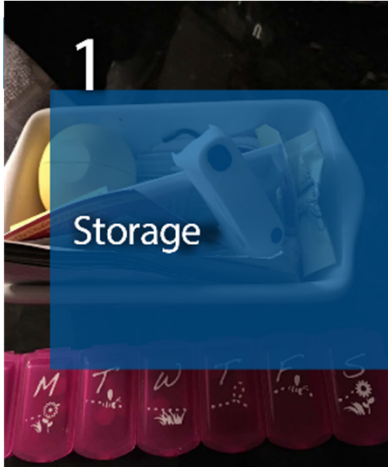
Clip on B (CoB) was the most preferred of the three options; Base received the highest number of unacceptable ratings

1. While participants liked the connectivity features, form factor significantly contributed to Clip On B's appeal
2. Participants who preferred Clip On A liked the small size, however the size was a detractor for others
3. Base impeded patients' current practices including needing two hands, pinching, spreading, or seeing the injection site
4. Participants shared their reasons for their likes and dislikes in side by side videos
5. Participants viewed reusability positively for environment cost and wastefulness features
6. Participants liked the cues from the lights and related them to other devices they use

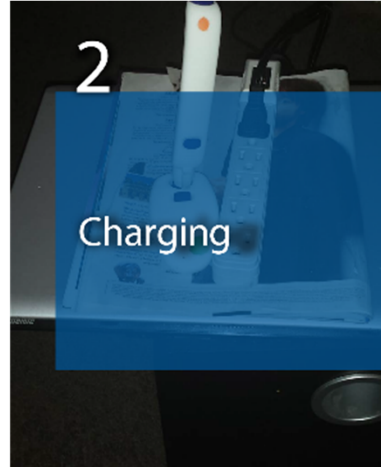


## Fitting connected systems into users' lives

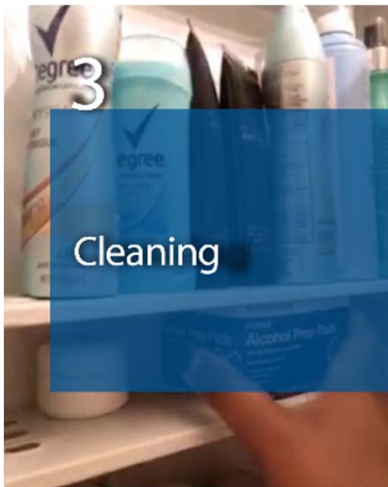
- Finally, participants showed how the accessory device would fit into their homes and lifestyles
- They took pictures of where they would store and charge it
- They also showed how they would pack it for travel, and described expected cleaning procedures



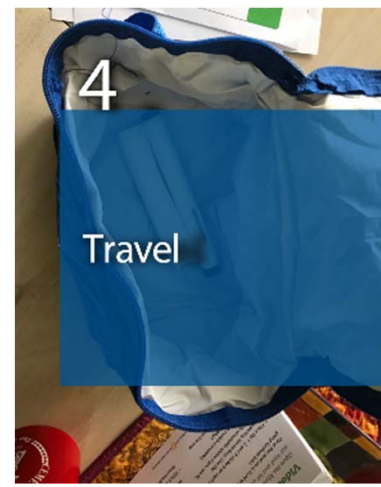
Patient's would store their accessory device with their injection supplies



Most preferred charging over a battery



Patient's were not concerned about cleaning the device



Those who travel with their injector see no issue in bringing their accessory device as well



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# Why Make Your Existing Auto-Injector Smart?



Pharma

## Value for Pharma:

- LCM
- Engagement
- Adherence lift
- Differentiation
- Research and Insights
- Outcomes based reimbursement



Patients

## Value for your Patients:

- Patients want it
- Modern & Efficient
- Ergonomic form factor options
- Right platform brings engagement



Providers



Payers



Pharmacy



Population Health

## Value for other "P"s:

Adherence and related data provides value opportunities for all P's



# Acknowledgments

Noble International, Inc  
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