



**HIV CENTER for Clinical and Behavioral Studies**  
at the New York State Psychiatric Institute and Columbia University

# Importance of the Right Microbicide Delivery Device (MDD) for Rectal Microbicide Acceptability

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[www.hivcenternyc.org](http://www.hivcenternyc.org)

# Acceptability and Adherence

- Microbicides need to be not only efficacious against HIV, but, equally important, products that people are:
  - Able and willing to use (acceptability)
  - Able to use correctly and consistently (adherence)
- Microbicide acceptability and adherence are heavily impacted by the MDD

# Gross et al., 1999; Tabet et al. 1999

## Advantage 24™

Gross et al., (1999).  
Acceptability of a  
bioadhesive Nonoxynol-9  
gel delivered by and  
applicator as a rectal  
microbicide. *STI*, 572-578.



# Gross et al. study: user feedback

**54% would NOT use the product.**

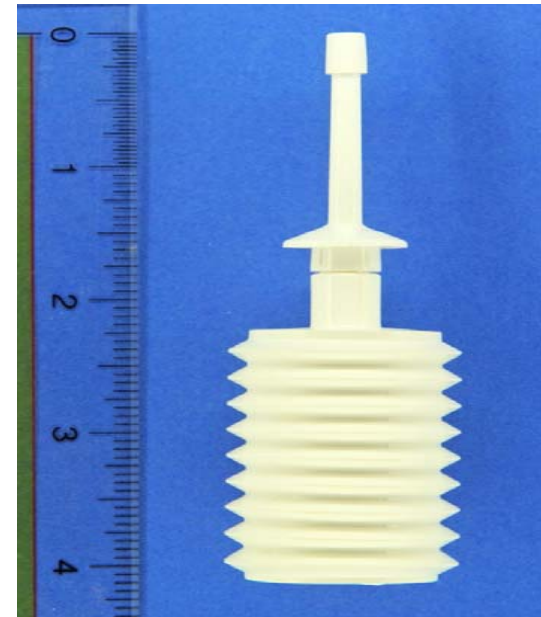
## **Complaints about the MDD:**

- variability of gel dispensed
- need to shake the applicator to get the gel into the delivery end of the device
- release of air with the gel
- after removal of twist-tab opener, tip had sharp edges
- too large for portability
- tampon-like appearance

# Formulation Preference Trial (Boston, MA – Carballo-Diéguez, PI)

- Gel vs. suppository
- Gel MDD needed to hold up to 35 mls of gel

(Results of this study are presented in the Acceptability session on Monday, 2/25 at 4:00 p.m.)



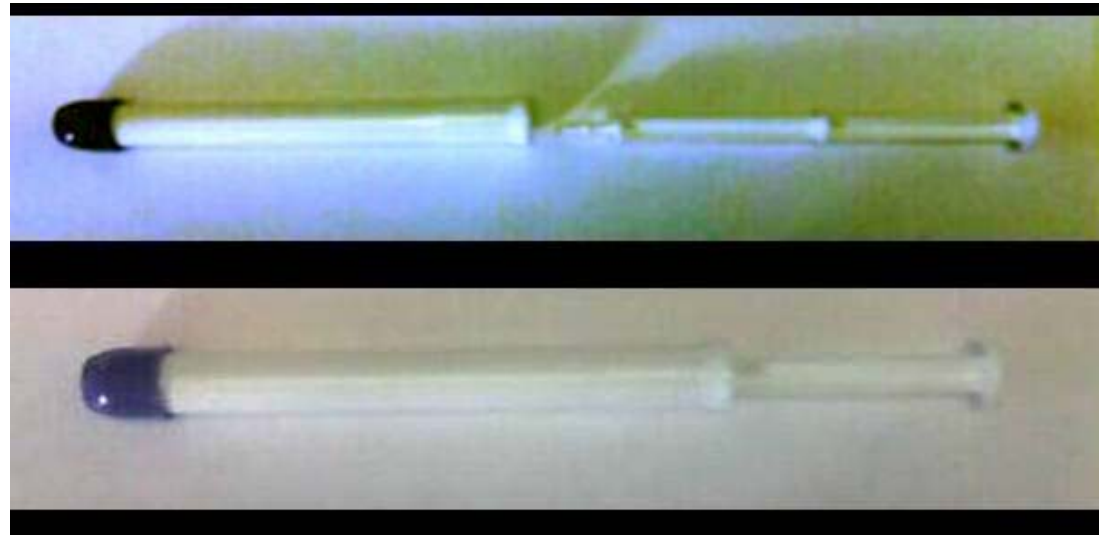
# Boston study: user feedback on gel MDD

- Make a longer, softer, and rounder tip
- Make a larger dispensing orifice
- Put slits on the side of the tip for the gel to exit
- The bulb should be larger and easier to squeeze
- The applicator should provide some way to know whether the full amount was delivered
  
- Applicator is “way too big to carry around casually” (54 y-o), “should be flat enough to carry in my pants pocket” (27 y-o)
  
- Change its color to make it look “less clinical and more exciting” (43 y-o), “I’ll bet Martha S. could suggest a couple of nice pastel, translucent colors” (55 y-o).



# P4 Study (Los Angeles, Anton PI)

Safety and  
Acceptability of the  
UC-781 Vaginal  
Microbicide Gel  
Formulation Applied  
Rectally





## LA study: user feedback on applicator

[Female C]

*[The applicator] could be improved a little bit. You know, maybe a little bit ... smoother ... The end is a little sharp or rough.*

[Male A]

*The only problem was kind of fumbling with the plunger [...] If it ... would be all one unit instead [of] two pieces, that might help.*

[Male B]

*I found the applicators a little cumbersome [...] it needs a little thing on the end where you can pose your fingers on it- ... It should have a lip or... two little handles or whatever.*



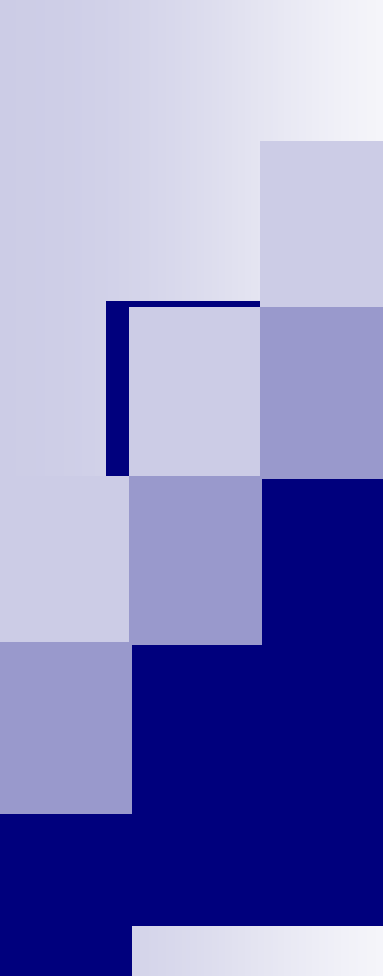


## LA study: user feedback on applicator

[Male C]

*the very first time [I applied the gel] in the office ... I left the blue cap on [laughter]. So, when I pressed the plunge[r] the little blue cap popped up and up inside [me], and, you know, that was a mistake ... on my part, though. I misunderstood the guy that was giving me the directions. But I got it out. If I made a mistake someone else can too [laughter]... Maybe the cap could come off when you open it or something like that.*





# Development of a Standard Rectal Microbicide Delivery Device

Columbia University

PATH

Funding provided by amfAR (106765-41-RGMC)

# Panel of experts

<b>Name</b>	<b>Institution</b>
Alex Carballo-Diéguéz	HIV Center for Clinical and Behavioral Studies
Peter Anton	UCLA
Tom Moench	ReProtect
Ian McGowen	UCLA
Craig Hendrix	Johns Hopkins
Pamina Gorbach	UCLA
Kenneth Mayer	Brown University
Anna Forbes	Global Campaign for Microbicides
Jim Pickett	Chicago AIDS Foundation

# MDD needed for two possible topical formulations

## **Gel**

- To deliver gel dose between 3–10ml
- Gel viscosity to range between 10,000–100,000 cps

## **Enema**

- To deliver liquid dose between 100–200ml

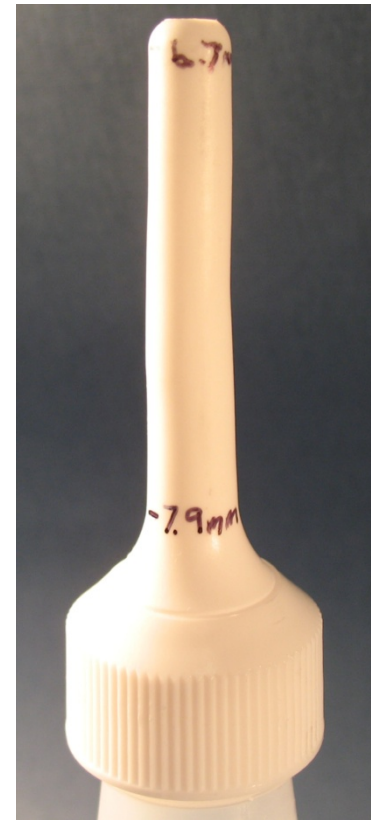
Ideally, different size ‘containers’ should use a standard, uniform sized tip.

# Device Tip

- User knows when tip is inserted 'far enough'
- Smooth surface
- Rounded end
- Deflection of tip by 1/2" requires 0.5 lbs force
- External tip diameter between 6-8mm
- Tip length should measure 4.2cm



*Micralax Applicator*



*Fleet Enema*

# Dispensing

- Single action delivers full dose
- User should know when full dose is delivered
- One-handed operation
- Can be dispensed without looking
- Waste should be minimized (no more than 25% of product remains in applicator)

# Dispensing (continued)

- Applicator precision – (within +/- 10% of intended dose)
- Time to dispense full dose 3 sec for gel or 5 sec for enema
- Minimal air in MDD
- Single-use, pre-filled, unit dose
- No user assembly required before use

# Length/Shape/Appearance/Price

- Small as possible, depending on required volume
- Fun, sexy, not 'medical-looking'
- Does not cause harm, pain upon insertion
- Easy to handle, comfortable to insert
- Will not leak during storage, transport
- \$0.10 at high volumes

# Drug compatibility/Shelf Life

- Must be compatible with microbicide
- Capable of 3-year shelf life stability in combination with packaged microbicide
- Minimize evaporation

# Bidding process

- Best bid: HTI Plastics (Lincoln, NE)



*HTI Plastics  
5120 NW 38th Street  
Lincoln, NE 68524*

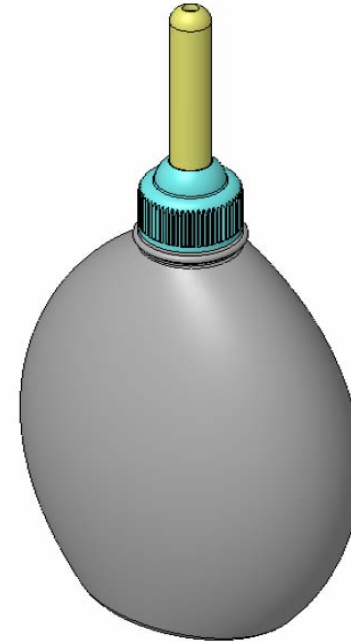
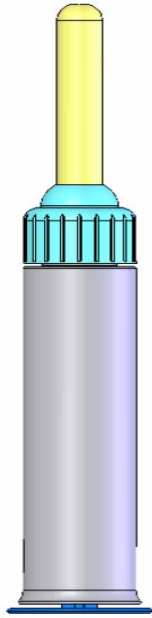
*Toll Free 1-800-824-0607*

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## Injection Molding and Tooling



# Early designs



# Semi-final prototype

- Incorporates Fleet <sup>TM</sup> tip
- Can be operated with one hand
- Has grips for the fingers
- Can deliver a precise dose up to 10 ml
- Used across clinical trials, this MDD will reduce sources of acceptability and adherence variability
- Can be manufactured in gray color

(see poster presentation TC-269)



# Remaining problems

- Small volume of air in tip
- Will require insertion of plunger into barrel
- Not too portable
- A user trial needs to be undertaken
- Further changes may be required
- Sponsors will need to do stability testing of given products



To be continued...

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