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# Antiretroviral Refill Adherence is an Early Predictor of Retention in HIV Care

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Infectious Diseases



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# Disclosure

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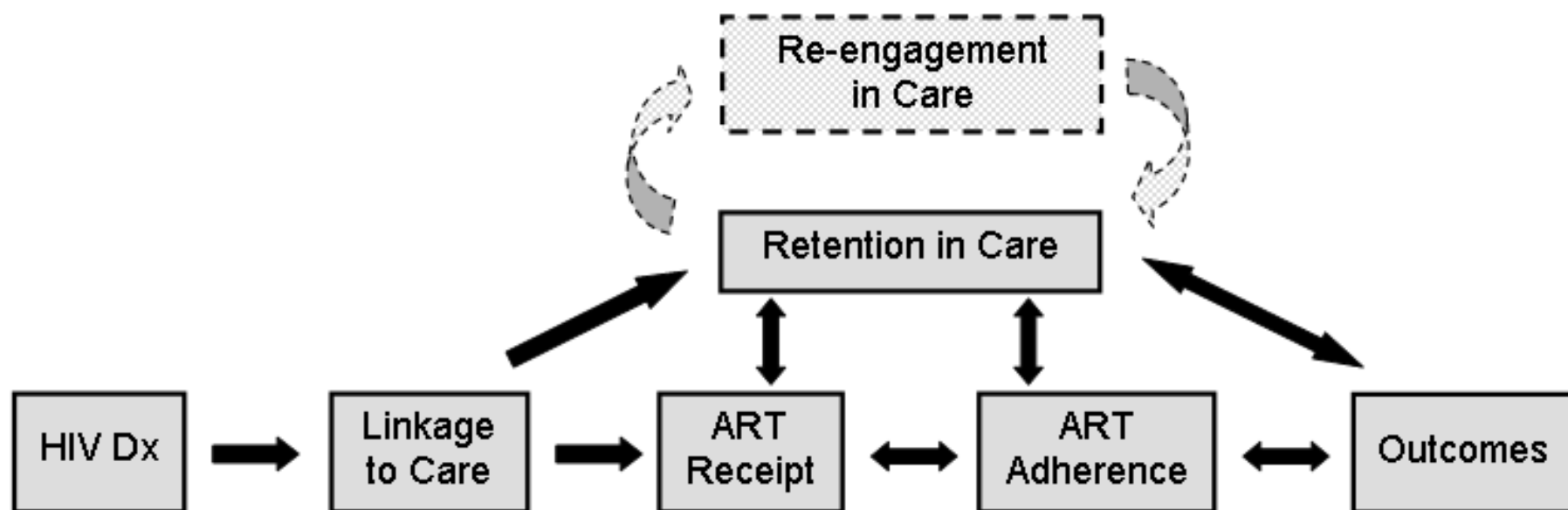
- **Pfizer**
  - DSMB member for trial of drug unrelated to HIV
  - During time of these studies
  - Ongoing

# Introduction

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- **“Drugs don’t work in people who don’t take them”-Koop**
  - Non-adherence is normal behavior
  - Perfect adherence is unrealistic
- **Non-retention is a related construct**
  - Prevents renewal of Rx
  - Decreased salience of therapy (?)
  - Decreased access to preventive care
  - Decreased effect of provider on behavior

# Continuum of HIV Care



# Hypothesis

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- **Can detection of non-adherence identify risk for non-retention?**
  - Pharmacy records valid measure of adherence
  - Monthly refills = frequent monitoring
  - Tracking possible despite absence of patient

# Study Design

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- **Retrospective cohort study**
- **Site**
  - Jonathan Lax Center, urban Philadelphia site
- **Population**
  - HIV infected adults prescribed ARVs
  - $\geq 2$  clinic visits  $\geq 4$  weeks apart
  - One visit after 5/2012 and another visit scheduled after 10/2012
  - Refills obtained via Walgreens (340B)
  - Exclude: automated refillers

# Variables Measured

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- **Primary outcome**
  - ‘No show’ to index visit
  - Index visit: randomly selected scheduled visit after 10/2012
  - ‘No show’=no call to reschedule
  - If rescheduled, another visit selected
- **Primary exposure**
  - Refill adherence (MPR) calculated every month over time of study

# Analysis Plan

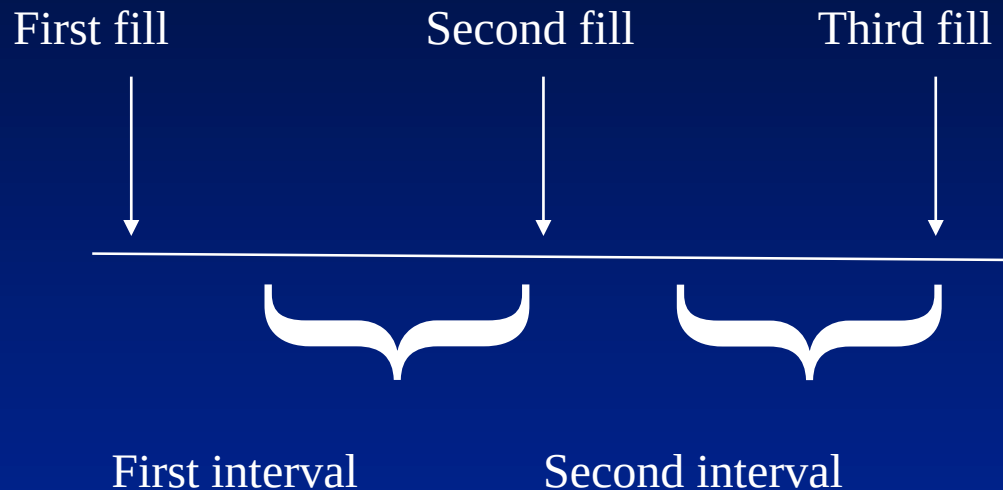
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- Summarize adherence every month back from index date
- Compare adherence between 'shows' and 'no shows'
  - Over entire interval
  - Over most recent time points
- Discriminative ability of adherence for 'no show'
  - Area under ROC curve
  - Sensitivity/specificity for 'no show'



# Time to 3 refills (2 months)

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Adherence metric:  $\Sigma \text{ intervals} / (3^{\text{rd}} \text{ fill date} - 1^{\text{st}} \text{ fill date})$

Missing refills imputed to occur on index date  
and enrollment date, as needed

Adherence conceptualized as either % doses taken or #  
days late for refill

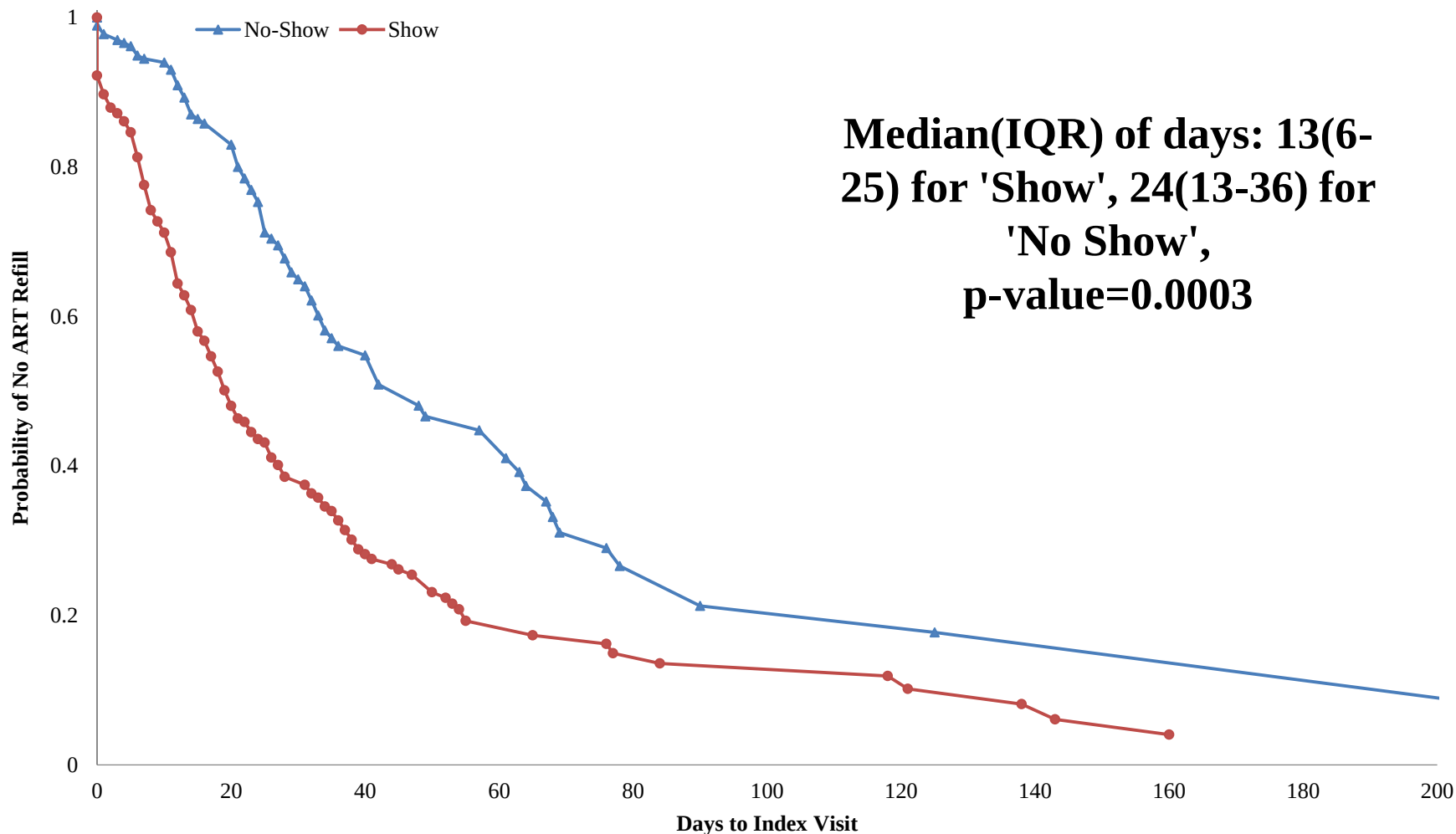
| Characteristic            | 'Show'<br>n=285 | 'No Show'<br>n=108 | p value |
|---------------------------|-----------------|--------------------|---------|
| <b>Median age (IQR)</b>   | 49 (42-53)      | 47 (38-52)         | 0.04    |
| <b>Sex</b>                |                 |                    |         |
| Male                      | 202 (71%)       | 70 (65%)           | >0.5    |
| Female                    | 81 (28%)        | 37 (34%)           |         |
| Transgender               | 2 (1%)          | 1 (1%)             |         |
| <b>Race</b>               |                 |                    | 0.033   |
| Black                     | 171 (60%)       | 77 (71%)           | >0.5    |
| White                     | 103 (36%)       | 25 (23%)           |         |
| Other                     | 9 (3%)          | 6 (6%)             |         |
| <b>Hispanic Ethnicity</b> | 24 (9%)         | 8 (7%)             | >0.5    |
| <b>Prior AIDS Dx</b>      | 145 (51%)       | 62 (57%)           | 0.13    |
| <b>MSM</b>                | 146 (52%)       | 45 (42%)           | 0.08    |
| <b>IDU</b>                | 49 (17%)        | 28 (26%)           | 0.09    |

# Adherence Differences

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- Overall effect
  - 9.3% (95% CI: 12.3-5.7%) more doses by 'shows' than 'no shows',  $p < 0.001$
- Limiting to most recent interval
  - 'Shows' 93.8% (66.7% - 107.1%) vs. 'No shows' 80% (53.6% - 107.1%),  $p < 0.005$

# Time from last refill to index date compared between 'show' and 'no show' groups



# Discriminative Ability

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- Area under ROC curve
  - ~0.6 (perfect=1.0, flip of a coin=0.5)
- Sensitivity/specificity poor

# Conclusions

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- **Non-adherence is associated with 'no show' to clinic**
  - No clear threshold amount of adherence predicts 'no show'
- **Incomplete overlap suggests related but distinct phenomena**
  - Caution required for contacting patients with suboptimal adherence
  - May not be at high risk of 'no show'
  - Yet allows for more adherence conversation

**Thanks to the study participants!**