



# Pre-Exposure Prophylaxis (PrEP)

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- A Biomedical Intervention
- “Prevention with Negatives”
- “Antiretroviral Prevention”



# New and Emerging Biomedical HIV Prevention Interventions

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- Vaccines
- Vaginal microbicides
- Pre-exposure oral chemoprophylaxis
- Antiretroviral treatment for HIV prevention
- Male circumcision



# Topics for Today

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- Overview of PrEP
- What we do know and do not know about PrEP
- Implementation issues
- Ethical issues
- Cost Issues



# What Is PrEP?

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- HIV negative individual takes antiretroviral (ARV) drug prior to potential HIV exposure
- The goal of PrEP is to reduce the likelihood of HIV infection
- Tenofovir (TDF) (Viread) is the ARV that currently is the most suitable for PrEP



## What Is PrEP? (cont'd)

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- TDF is potent, can be dosed once daily, has a favorable toxicity profile, few adverse side effects and interactions with other drugs
- Truvada [TDF + FTC (emtricitabine)] is also approved for PrEP use
- Optimal PrEP dosing strategy yet to be determined



# What We Do Know about PrEP

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- It will not *replace* other proven prevention strategies because it is unlikely to be 100% effective
- Would likely be most effective when used in combination with current HIV prevention methods
- Another tool with safer sex practices, condoms, STD Tx, clean needles, etc.



# What We Do Know about PrEP

(cont'd)

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- Clinical trials are being conducted to determine how effective PrEP is in preventing HIV transmission
- Initial results from PrEP efficacy trials should be available this year
- Current trials will still leave many unanswered questions, requiring additional research



# What We Do Know about PrEP

(cont'd)

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- Efficacy trials are designed to produce results in diverse populations, with multiple transmission routes
- Hx men/women in high prevalence area
- Serodiscordant Hx couples
- IDUs
- MSM



# Timeline for Efficacy PrEP Trials

(as of May 2009)

Window to Possible  
Interim Results



2004	2005	2006	2007	2008	2009	2010	2011	2012
	Bangkok Tenofovir Study IDU, Thailand							
		TDF2 HRH women and men, Botswana						
			CAPRISA 004 Women, South Africa					
			IPrEx MSM, multinational					
				Partners PrEP Discordant couples, East Africa				
					Fem-PrEP Women, East/Southern Africa			
					VOICE Women, East/Southern Africa			



# What We Do Know about PrEP

(cont'd)

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- PrEP is likely to be most effective in higher prevalence populations
- PrEP is likely to be most effective in those unable to consistently adhere to current risk reduction strategies
- PrEP can be used without negotiation so those who can't negotiate condom use will still be able to reduce their risk



# What We Do Know about PrEP

(cont'd)

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## Potential PrEP Users

- HIV uninfected persons
  - with a sexual partner known to be HIV+
  - with frequent partner change or concurrency
  - with partner(s) at high risk of HIV infection (e.g. injection drug users, non-monogamous)
  - with other evidence of risk (e.g., frequent STD or unwanted pregnancies)
- Unable to (consistently) use other prevention modalities



# What We Do Know about PrEP

(cont'd)

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- Could serve as a safety net during lapses in consistent low risk behavior
- PrEP holds potential for serodiscordant couples trying to conceive
- Gender neutral
- Not dependent on anticipating risk events
- May work for more than one type of exposure (e.g., IDU who also have sex)



# What We Don't Know about PrEP?

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- Continuous dosing?
- Episodic dosing?
- How long should use of PrEP continue for an individual? Lifetime use?
- Can safe and effective PrEP strategies be developed for adolescents and pregnant women?



# What We Don't Know about PrEP? (cont'd)

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- What other compounds can be developed for PrEP drugs?
- What are the long term safety consequences for PrEP use?
- What are the rates of drug resistance associated with individuals using PrEP who become HIV+? Future Tx options?



# What We Don't Know about PrEP? (cont'd)

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- The interaction of PrEP drug regimens with alcohol and other drugs has not been studied



# Implementation Issues

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- Identifying the most appropriate mix of prevention interventions and where PrEP falls into the mix
- Current trials are heavy on counseling and have many other supports for study subjects. How well does this translate into “just the pill?”





# Implementation Issues (cont'd)

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- All trials place a remarkable amount of emphasis on adherence
- How do we take this into general usage where that emphasis no longer exists?
- Also, the question itself: “just how adherent does one have to be to make PrEP effective?”



# Public Health & Ethical Issues

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- False assumption PrEP is fully protective
- Avoiding increases in risk behaviors-  
criticality of not substituting a partially  
effective intervention for other, more  
effective tools
- Will people who are truly intractable to  
current prevention strategies be likely  
to adhere to rigorous PrEP regimens?



# Public Health & Ethical Issues

(cont'd)

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- Cost would be substantial; CDC estimate that \$1 Billion needed even if PrEP were targeted 100,000 at highest risk
- That's more than the entire current CDC HIV prevention budget
- Can't use RW \$ since only for HIV+



# Estimated Annual Drug Cost (US)

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	Viread ® TDF	Truvada® TDF+FTC
Pharmacy	\$7,200	\$10,800
Public Health Price	\$3,600	\$6,600



# Cost-effectiveness

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- Can be cost-effective (or cost-saving) if:
  - Targeted to persons at highest risk of HIV acquisition
  - Efficacy is high
  - Medication costs can be reduced



# Public Health & Ethical Issues

(cont'd)

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- Should we be providing ARVs for prevention when not all PLWH are getting ARVs to stay alive?
- Especially when there are less expensive, more effective prevention interventions available