

*TReND Meeting*

# **Progress and Research Gaps in Understanding Nicotine Dependence and Smoking Cessation among Diverse Populations**

**Eliseo J. Pérez-Stable, M.D.**

**Professor of Medicine**

**Division of General Internal Medicine, Department of Medicine**

**Medical Effectiveness Research Center for Diverse  
Populations, UCSF**

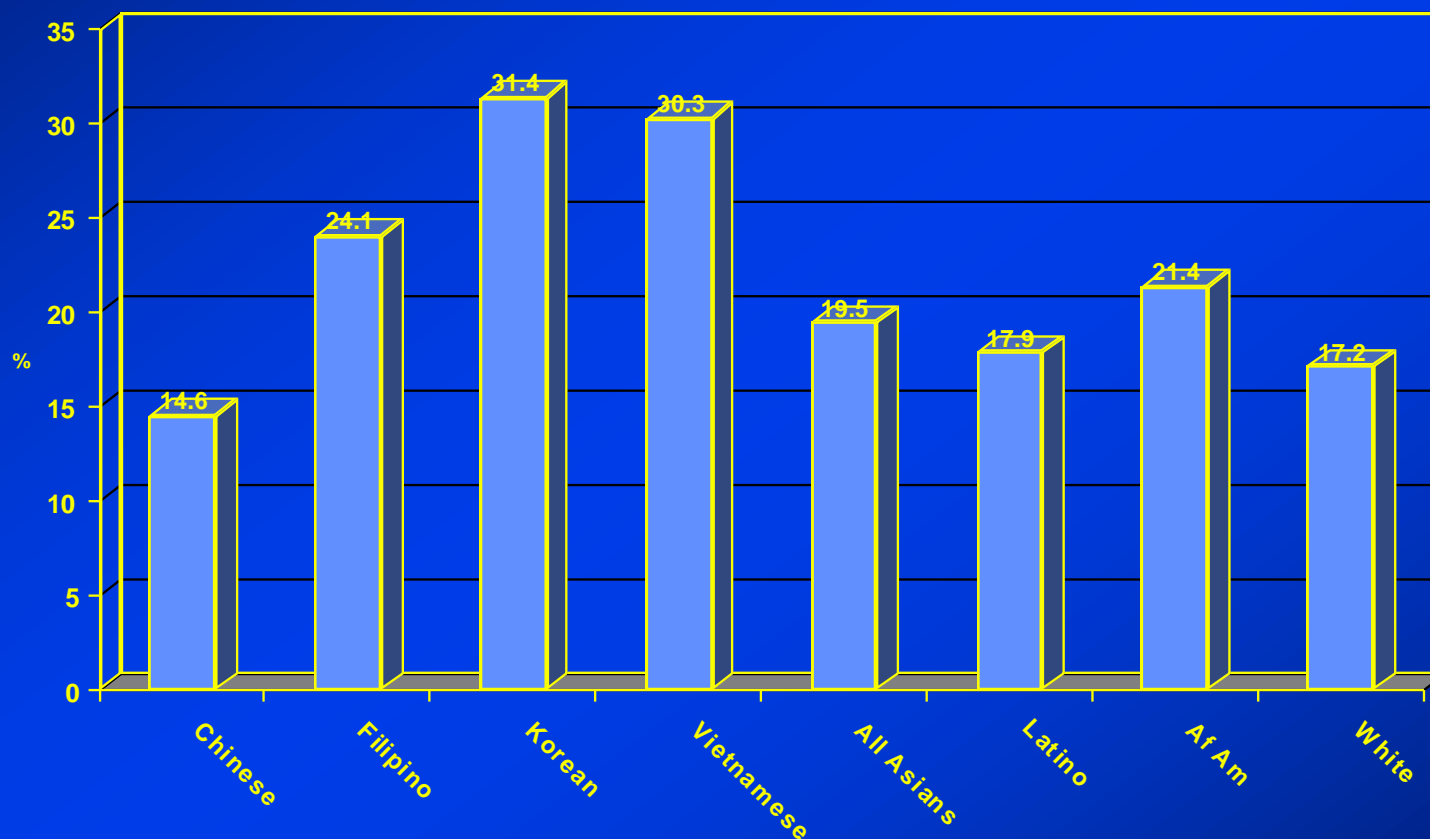
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# Cigarette Smoking in the U.S. – 2008

## National Health Interview Survey

	% Men	% W omen
White	23.5	20.6
African Am	25.6	17.8
Latino	20.7	10.7
Asian	15.7	4.7
Am Indian	42.3	22.4
8 years o r less	24.2	13.0
9 -11 yrs school	38.1	33.6
high h school d ipl	30.0	21.5
Colleg e degree	11.5	9.7

# Current Smokers among Men in California, 2005



**California Health Interview Survey**

# Cigarette Smoking Behavior in Latinos by Sex, NHLIC *En Acción*, 1993-1994

	Percent Current Smokers	
	Men	Women
	%	%
Mexican American	25.0	10.4
Central American	23.0	10.1
Puerto Rican	27.6	24.2
Cuban American	24.7	12.4
South American	23.0	15.8

# Acculturation and Smoking Behavior in Latinos: Good for Men and Bad for Women

	Percent Current Smokers	
	Men	Women
<i>Acculturation Score</i>		
1 to <2 (less)	25.7	10.3
2 to <3	25.0	11.9
3 to <5 (more)	23.0	15.5

# **Cigarette Smoking Prevalence, Study of Latinos Baseline, 2009**

<b>National Origin</b>	<b>Men (2807)</b>	<b>Women (4261)</b>
<b>Cuban</b>	<b>28%</b>	<b>25%</b>
<b>Puerto Rican</b>	<b>38%</b>	<b>34%</b>
<b>Dominican</b>	<b>12%</b>	<b>12%</b>
<b>Mexican</b>	<b>20%</b>	<b>10%</b>
<b>Central Am</b>	<b>18%</b>	<b>9%</b>
<b>South Am</b>	<b>25%</b>	<b>11%</b>

# TReND Projects

- **Light and Intermittent Smoking and Smoking Cessation in the US**
- **Role of Menthol in Nicotine Dependence among Light Smokers**
- **Application of the Biopsychosocial Model: DNA Methylation and Cancer Risk**

# Light and Non-Daily Smokers

## *Tobacco Use Supplement CPS, 2003*

	% C u r r e n t	% N o n - D a i l y / 1 - 5
White	24.5	17/ 5
African Am	20.3	24/12
Latino	14.2	35/18
Asian/PI	12.3	30/14



# Smoking Cessation Patterns

- **Light smoking has not translated to more success in cessation**
- **Complete home smoking bans more common among Latinos and Asians and less common among Blacks**
- **Less frequent use of NRT**
- **No difference in advice by clinicians**

# Clinician Mediated Smoking Cessation Treatments

- Potentially culturally appropriate method
- Ethnic minority physicians care for a disproportionate number of minorities
- No difference in receipt of advice among minority smokers in 1998-99 Tobacco Use Supplement
- Overall increase in counseling in 1990s
- Regional data indicate less counseling of Latino smokers by clinicians

# Pharmacological Treatment of Smoking Cessation

- Most RCT data in studies with Whites
- No published drug trials with Asian/PI and one NRT study with Latinos
- 6 trials with African Americans: NRT and bupropion effective
- Dependence measures predicted success in African Americans
- Smokers of mentholated cigarettes were less successful at quitting

# **CBT for Smoking Cessation in African Americans**

- **154 smokers; CBT vs. General Health Education; 65% women**
- **6 counseling sessions + NRT 8 wks**
- **6 mo: 31% vs. 14% quit 7 day point prevalence**
- **Adjusted OR = 2.6 (1.4 to 4.7)**
- **Similar effects on continuous abstinence**

**Webb MS, et al. J Consult Clin Psychol 2010; 78:24-33**

# Questions and Gaps in Cessation Research

- Tailoring messages by race/ethnicity has become standard in behavioral and self-help interventions
- Evidence that cultural tailoring works?
- Smoking reduction as an intermediate outcome —incremental change?
- Role of perceived treatment assignment
- Recruitment to intervention trials

# Menthol and Dependence

- Use of menthol cigarettes almost exclusively among African Americans and Puerto Ricans
- Increase dependence by cooling smoke sensation?
- Associated with smoking within 5 minutes of waking among light smokers of 6 to 10 cigarettes per day

## Ethnic Differences in Serum Cotinine Levels: NHANES 3

	>15 ng/ml percent	≤15 ng/ml percent
<b>African Ams</b>		
<b>smoker</b>	96	4
<b>non-smoker</b>	2	98
<b>Whites</b>		
<b>smoker</b>	94	6
<b>non-smoker</b>	2	98
<b>Mexican Ams</b>		
<b>smoker</b>	72	28
<b>non-smoker</b>	1	99

## **Optimal Serum Cotinine for Distinguishing Smokers and Nonsmokers**

- **NHANES: 13,078 nonsmokers and 3,078 smokers; based on ROC curves**
- **Whites: 5.92 ng/ml**
- **African Americans: 4.85 ng/ml**
- **Mexican Americans: 0.84 ng/ml**
- **Overall cut point is 3.08 ng/ml; 96% sensitivity and 97% specificity**
- **14 ng/ml underestimates smokers**

**Benowitz N, Am J Epidemiol, November 19, 2008**



# Nicotine Metabolism and Intake in African Americans

- African Americans have 50% more lung cancer and higher cotinine levels per cigarette despite fewer cigarettes/day
- Total and renal clearance of cotinine were 20% lower in African Americans
- Nicotine intake per cigarette was 30% greater in African Americans

# Personalize Cessation based on Biological Metrics?

- CYP2A6 genotype (main nicotine metabolizing enzyme)
- 3HC/Cot as marker of metabolism
- African American light smokers
- Persons with slower metabolism had higher nicotine levels
- Slowest 3HC/Cot quartile had higher quit rates with OR = 1.85 (1.1-3.2)

Ho MK, et al, Clin Pharmacol Ther 2009; 85: 635-43.

# Biological Pathways of Tobacco-Induced Diseases

- **Effects of cigarette smoke condensate on DNA methylation of several genes in lung cells**
- **Availability of other agents that may modulate the effects of tobacco smoke on gene DNA methylation**

# Genetics of Nicotine Dependence

- **Choline acetyltransferase gene associated nicotine dependence**
- **Evaluate Fagerstrom with 14 SNP in 1,366 persons from 402 Af Am families; 671 Whites from 200 fam**
- **Two haplotypes had significant association with 3 dependence measures in Af Ams in sample**

Wei J, et al. Human Genetics 2010; 127: 691-8

# Genetics of Nicotine Dependence

- Cholinergic nicotinic receptor (alpha3/alpha5/beta4 complex (CHRNA3/CHRNA5/CHRNB4) subunit gene cluster on chromosome 15q24-25
- Association of CHRNA5 SNP rs16969968 with nicotine dependence in both Blacks (OR=2.04; 1.15–3.62) and Whites (OR = 1.40; 1.23 – 1.59)

# Genetics of Cessation by Race and Gender

- Genomic region 11q23.1 associated with nicotine dependence
- 270 Black and 368 White participants in Baltimore ECA study
- GTG haplotype more likely to quit among Black men (56% vs. 22%) but not women (21% vs. 24%)

David SP, et al. Nicotine Tob Res 2010; 12: 251-62

# Variance in the Cessation Paradigm?

- **Light smokers are less addicted**
- **Non-daily smokers are not addicted**
- **Pharmacological treatment needs to be modified for these smokers**
- **Adapt behavioral interventions directed at light smokers for use in self-help, internet and quit line**

# Concluding Comments

- Cigarette smoking is less frequent and less intense among minorities
- Cessation paradigm needs to adapt to light and non-daily smokers
- Limited data on drug treatment but no reason to doubt efficacy
- Biological pathways may vary
- Self-help, culturally appropriate materials available