



Center on
Rural Addiction
UNIVERSITY OF VERMONT



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Rural Addiction**
UNIVERSITY OF VERMONT

Community Rounds Workshop Series

Reaching People Where They're At: Smoking Cessation Treatment Delivery at Your Door

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Disclosures

There is nothing to disclose for this UVM CORA Community Rounds session.

Potential Conflict of Interest:

All potential conflicts of Interest have been resolved prior to the start of this program.

All recommendations involving clinical medicine made during this talk were based on evidence that is accepted within the profession of medicine as adequate justification for their indications and contraindications in the care of patients.

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Agenda

Agenda

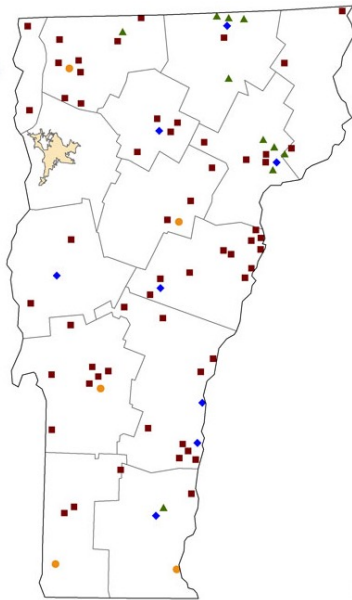
1. Challenges to Smoking Cessation in Rural Areas
2. Problems that Undermine Population Cessation
3. Medication Sampling as a Pragmatic Solution?
4. 3 (or possibly 4) Studies of Medication Sampling
5. Benefits, Limits, and Significance of Medication Sampling

**Caveat: None of the studies discussed today were designed with rurality in mind.
But they all offer implications for rural care**

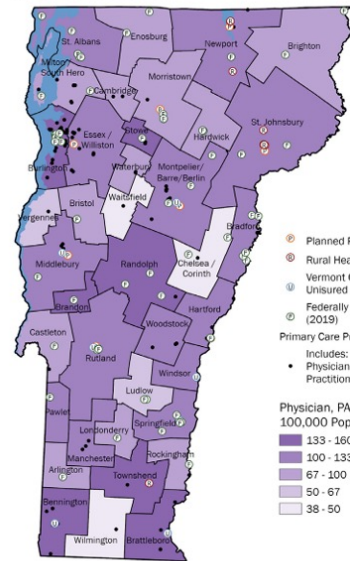
Preaching to the Choir

Selected Rural Healthcare Facilities in Vermont

- ◆ Critical Access Hospital
- ▲ Rural Health Clinic
- Federally Qualified Health Center Site in Rural Area*
- Short Term/PPS Hospital in Rural Area*
- *Non-Rural Area (U.S. Census Bureau Urban Area with a population of 50,000 or more)



Primary Care Practices by Rational Service Area

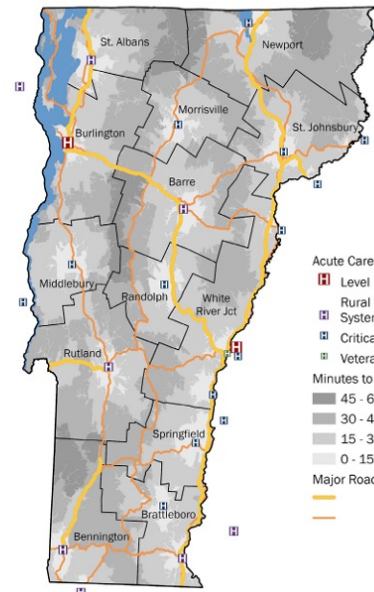


- Planned Parenthood (2019)
 - Rural Health Centers (2019)
 - Vermont Coalition of Clinics for the Uninsured and Free Clinics (2019)
 - Federally Qualified Health Centers (2019)
 - Primary Care Practices
 - Includes: Physicians (2018), Physician Assistants (2018), Nurse Practitioners (2017)
- Physician, PA, and NP FTEs per 100,000 Population (2017, 2018)
- 133 - 160
 - 100 - 133
 - 67 - 100
 - 50 - 67
 - 38 - 50



Source: Vermont Department of Health; Health Care Provider Census (2017, 2018); BQState Association; Safety Net Provider List (2019)

Hospitals in and near Vermont by Hospital Service Area




- Acute Care Hospitals
- Level 1 Trauma
- Rural Prospective Payment System (PPS)
- Critical Access
- Veteran's Affairs
- Minutes to the Nearest Hospital
- 45 - 60
- 30 - 45
- 15 - 30
- 0 - 15
- Major Roads

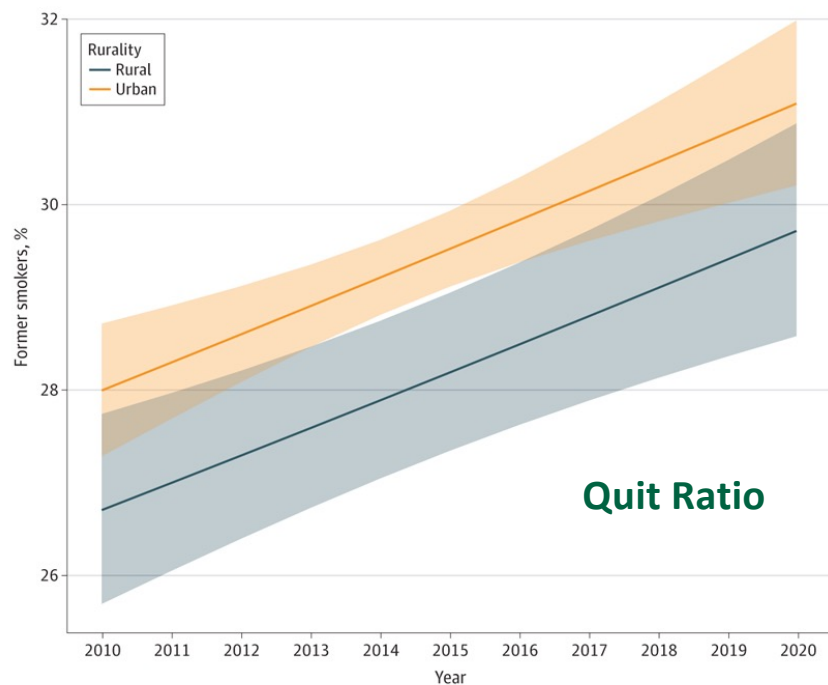


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Disproportionately Affected Populations: Rural Smokers

- Smoking prevalence of 19.0% compared to 11.4% among adults that live in urban areas ¹
- Rural smokers more likely to smoke more heavily, smoking 15 or more cigarettes per day, compared to those who smoke and live in urban areas ²
- Kids in rural areas are also more likely to start smoking at a much younger age and smoke daily, making addiction more severe and smoking harder to quit ³
- **Odds of quitting 75% lower in rural areas compared with urban areas ⁴** 



1. Cornelius et al MMWR Morb Mortal Wkly Rep 2022;71:397–405.

2. Centers for Disease Control and Prevention. National Center for Health Statistics

3. American Lung Association. Cutting Tobacco's Rural Roots: Tobacco Use in Rural Communities. Chicago: American Lung Association, 2015

4. Parker, et al. JAMA Network Open; 2022; 5: e2225326.



Existing Strategies to Reach Rural Smokers

Quitlines

- Increase quitting
- Are cost effective
- Usage can be improved through systemic inducements
 - E-referrals
 - Medication give-away
- But at the end of the day, usage is VERY LOW: **1% of smokers use quitline annually**
- Even among smokers who make a quit attempt, and who are aware of the quitline, usage: 8%

Primary Care Providers

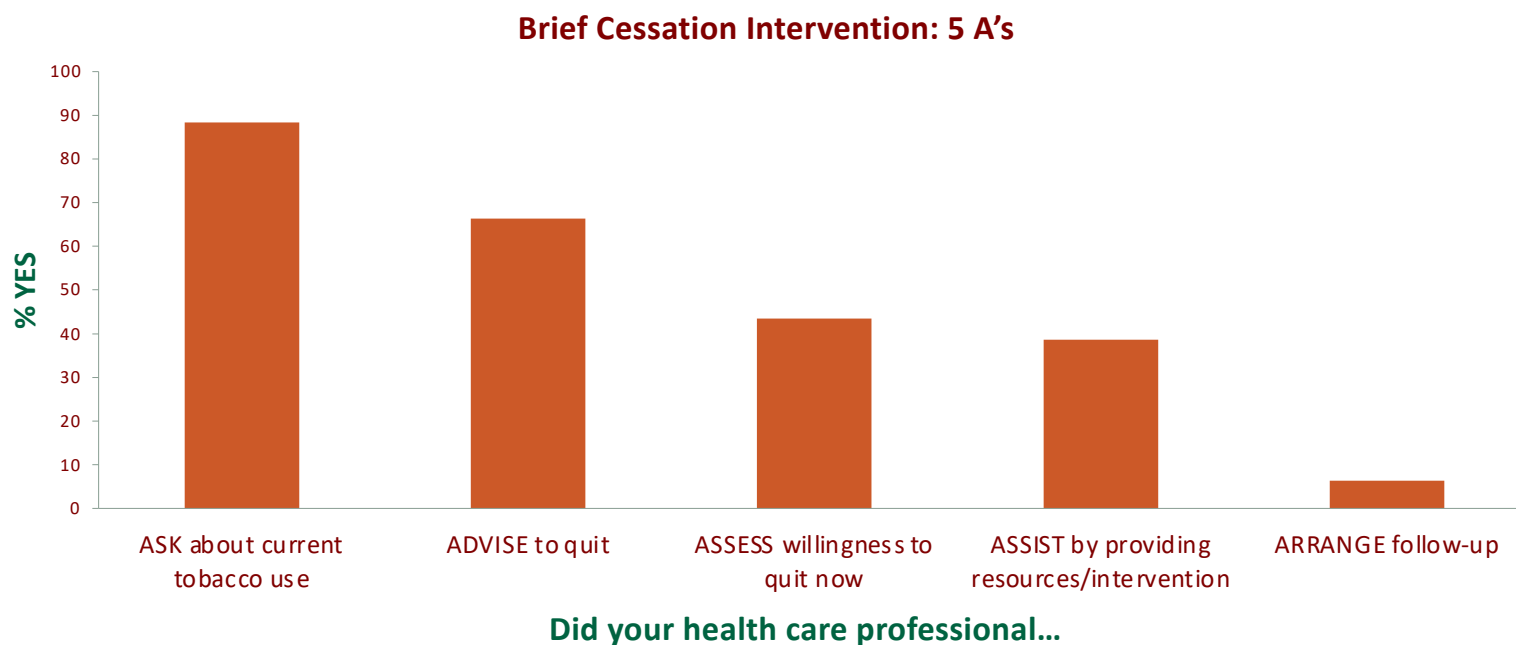
- 5As: Ask, Assess, Advise, Assist, and Arrange
- When it is done, brief works (Stead 2013: Cochrane Review). Low rates of quitting but large potential for wide reach.
- Among all preventive health services, tobacco screening and brief interventions are considered in top three to be most impactful and cost effective (Maciosek 2006)



Problems that Undermine Population Cessation

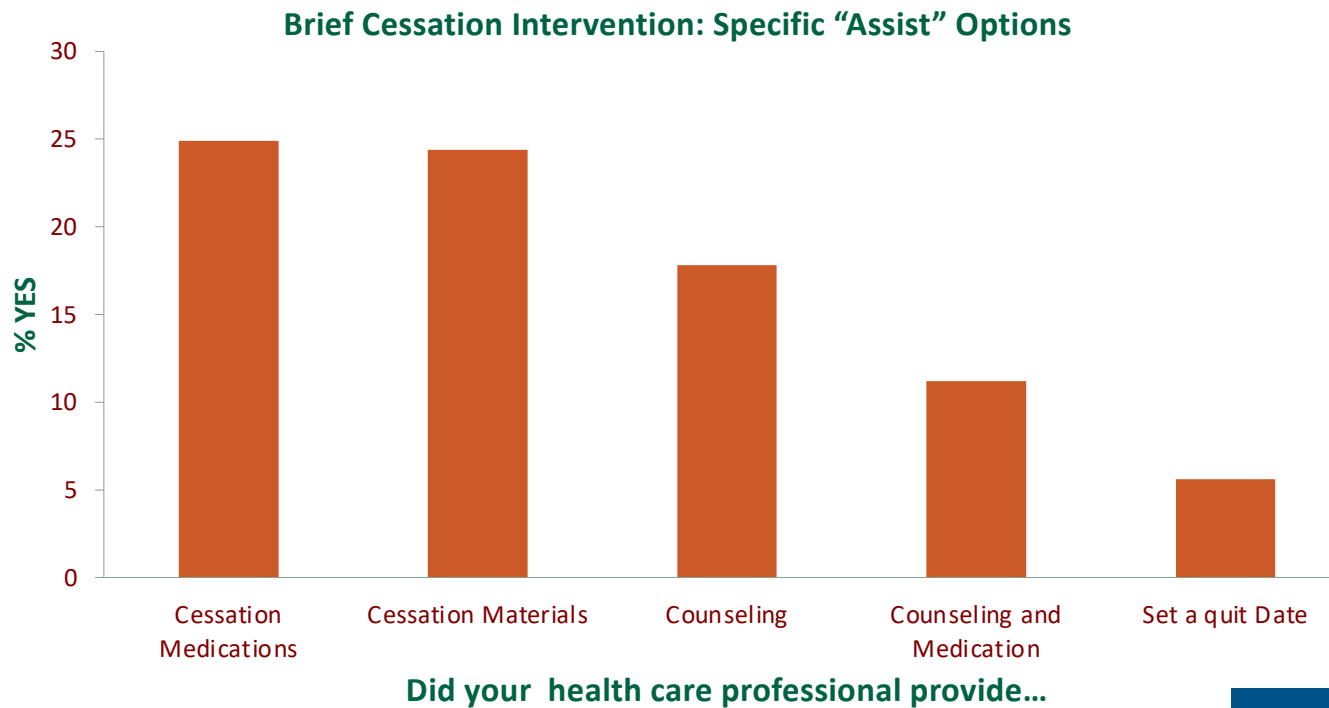
- Problem #1:** Receipt of advice to quit is inconsistent
- Problem #2:** Many smokers unwilling or unable to quit
- Problem #3:** Many smokers have misperceptions against evidence-based treatment
- Problem #4:** Use of evidence-based methods is abysmally low
- Problem #5:** Words don't always work. Treatments do not easily lend themselves to practical settings

Receipt of 5'A's Among Smokers 2009-2010



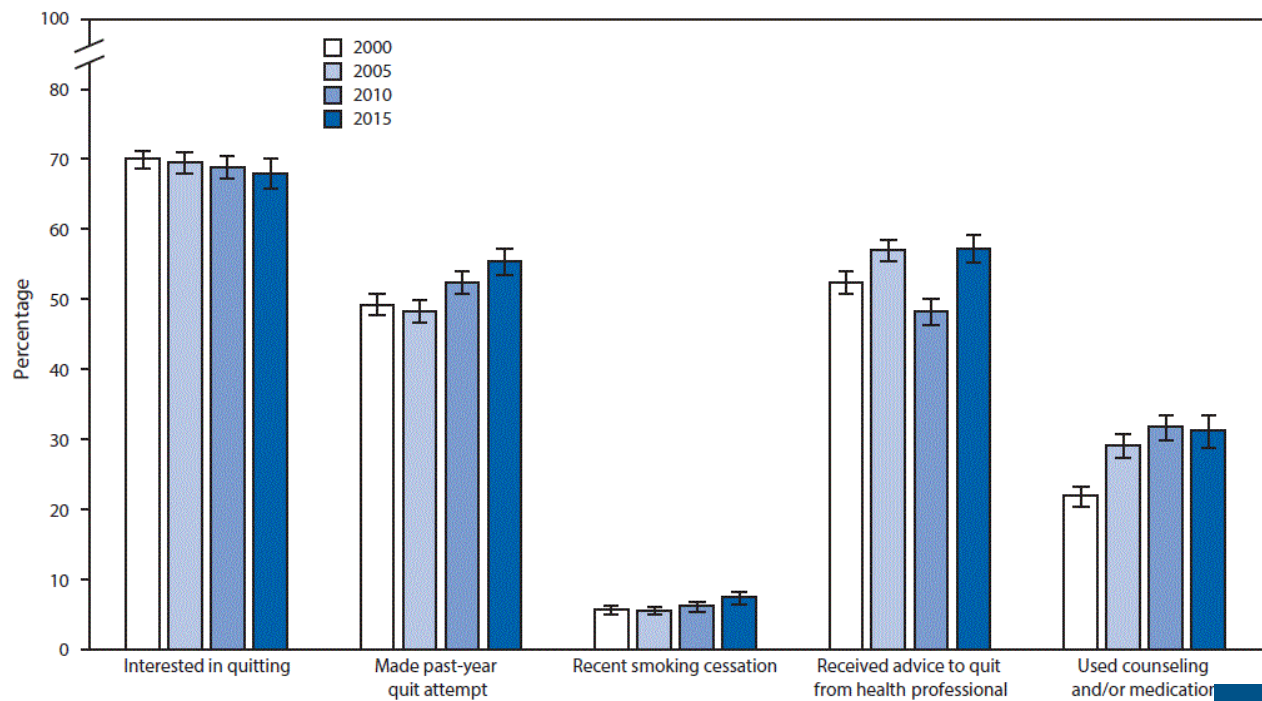
Source: Kruger, et al (2016). *BMC Public Health*, 16(141).

Receipt of 5'As Among Smokers 2009-2010



Source: Kruger, et al (2016). *BMC Public Health*, 16(141).

Prevalence & Change in Quit Behaviors, Among US adult smokers

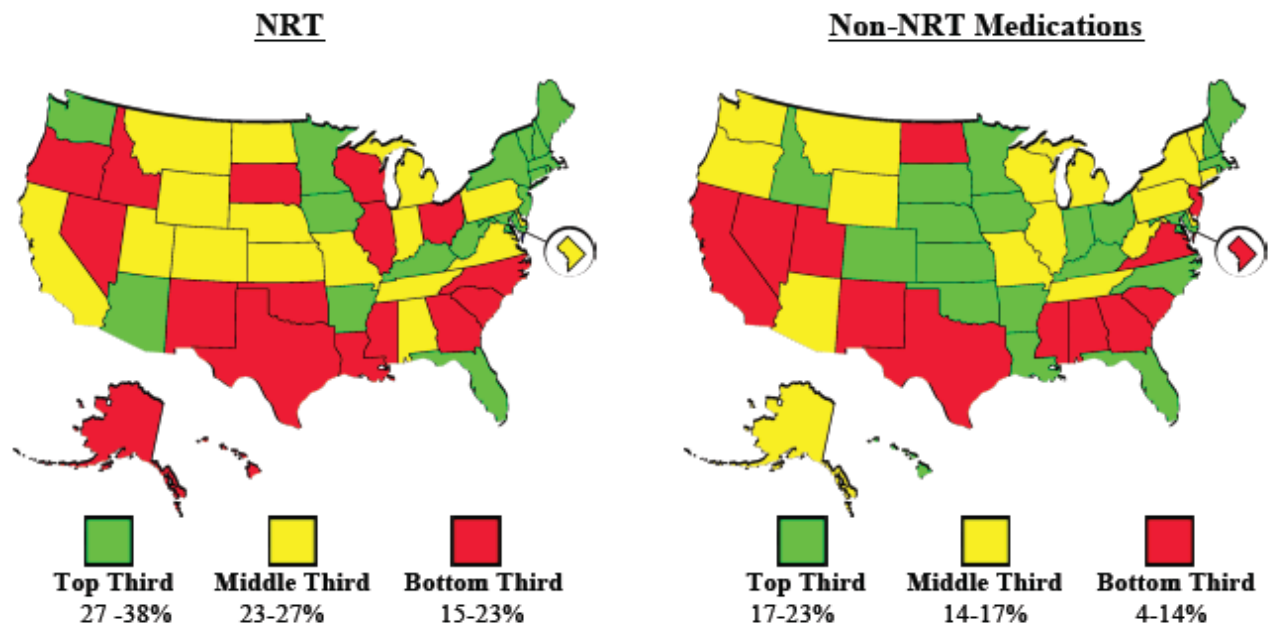


CDC / MMWR 2017 (65:1457-1464)

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Use of evidence-based methods is abysmally low



Dahne, Wahlquist, Garrett-Mayer, Heckman, Cummings, Carpenter MJ. Nicotine & Tobacco Research. 2018;20:1336-43.

Problems that Undermine Population Cessation

Problem #1: Receipt of advice to quit is inconsistent

Problem #2: Many smokers unwilling or unable to quit

Problem #3: Many smokers have misperceptions against evidence-based treatment

Problem #4: Use of evidence-based methods is abysmally low

Problem #5: Words don't always work. Treatments do not easily lend themselves to practical settings

Solution?

A Return to Pragmatism . . . Simpler Can be Better

Need for Pragmatic Interventions

- Reliable
- Valid
- Sensitive to Change
- Feasible
- Important to Practitioners
- Public Health Relevance
- Actionable
- Broadly Applicable
- Low Cost
- Enhances Patient Engagement
- Do no Harm

What Does Pragmatic Mean to Me?

- BRIEF
 - Active treatment for ALL smokers, not just those wanting to quit
 - No extensive training needed
 - No complicated instructions
 - Face valid to smoker and clinician
-
- Yes, intensive usually is better. But willing to sacrifice some efficacy if it means getting better reach

Impact = Efficacy x Reach

In the Context of Smoking Cessation: What Does Pragmatic Mean to Me?

Need to increase accessibility and reach of treatments:

- Lower cost
- Active Treatment for Everyone
- Less than full course treatment: once/day packaging, [free] sampling
 - Available on a whim
 - Removal of messaging of “need to quit for good”

Providers need more and better tools; Need strategies that are:

- Brief
- Easy to implement
- Noninvasive of either clinic procedures or doctor/patient dialogue

Medication Sampling

Simply providing a short course (2-4 weeks) of one or more cessation medications, given broadly, with minimal instructions without any firm commitment to quit

Kick the Tires of Cessation
Test Drive Abstinence

whatever metaphor you like



Sampling Cessation Medication Increasing Treatment Accessibility

Rationale

- Allow smokers to come to cessation on their own terms
- Concrete, behavioral
- Immediately actionable
- Minimal intervention; incredibly cheap
- Outcomes:
 - Treatment engagement (buy more)
 - Increase positive view of quitting (want to vs. have to)
 - Quit attempts
 - and yes. . . Cessation

Counter-Arguments Against:

- Haphazard attempts, likely to result in failure, will further frustrate smokers
- Smokers need more hands-on guidance and support; provide needed tools
- Only a full course, intensive medication regimen will work

NRT Sampling – Part I

Design: 6 weeks of sampling NRT, in the context of a practice quit attempt. Everyone followed for additional six months. N=849 smokers NOT motivated to quit, nationwide

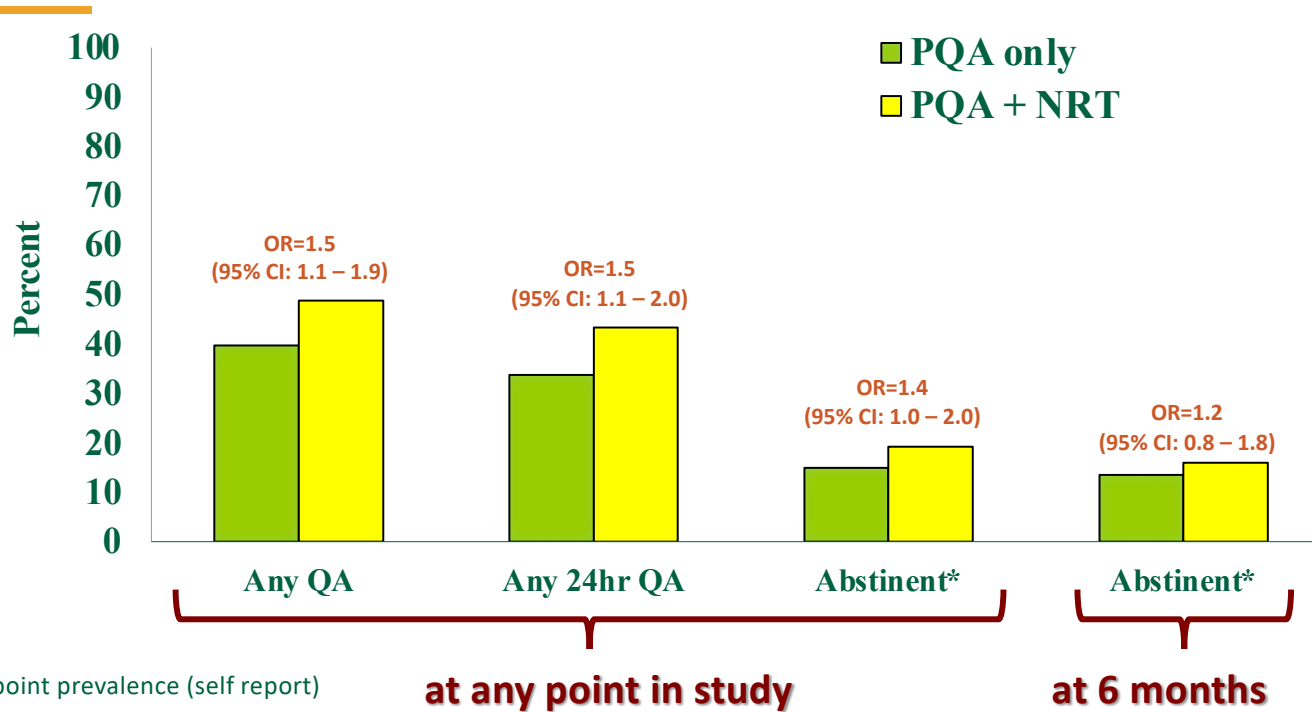
Practice Quit Attempt

- short period (hours, days) of sampling abstinence
- remove stress of trying to quit for good
- learn coping behaviors
- what works, what doesn't

PQA + NRT

- same as above
- sample NRT
- learn how it works, what it does, what it doesn't do, etc
- NRT → nicotine lozenge: OTC, prn dosing, minimal side effects

NRT Sampling – Part I



* Abstinence: 7 day point prevalence (self report)

Carpenter et al. 2011. Archives Internal Medicine; 171:1901-1097.

NRT Sampling – Part I

	Baseline			End of Treatment		
	<u>NRT Sampling</u>	<u>Control</u>		<u>NRT Sampling</u>	<u>Control</u>	
MTQ (0-10)	2.4	2.6	ns	4.1	3.0	p<.01
Abstinence Self-Efficacy (0-10)	4.0	3.9	ns	5.0	4.2	p<.01
Knowledge of NRT (0-10)	4.7	4.9	ns	6.7	5.9	p<.01
+ Attitudes toward NRT (1-4)	3.0	3.0	ns	3.2	3.0	p<.01
- Attitudes toward NRT (1-4)	2.8	2.6	ns	2.0	2.6	p<.01

Carpenter et al. 2011. Archives Internal Medicine; 171:1901-1097.

Burris et al. 2015. Psychology of Addictive Behaviors; 29:392-399.

NRT Sampling – Part II

What would happen if we gave the same sampling intervention, with no accompanying behavioral support, to all smokers? How important is motivation to quit? Will treatment be wasted? Smaller scale RCT: N=157 smokers statewide.



MNQ:

- Smokers Motivated to Quit
- Given 2 weeks supply of patch & lozenge
- Quitline referral



UNQ:

- Smokers Not Motivated to Quit
- Given 2 weeks supply of patch & lozenge
- Quitline referral



How will this group do?



UQ:

- Smokers Not Motivated to Quit
- Quitline referral

Shared Commonality:

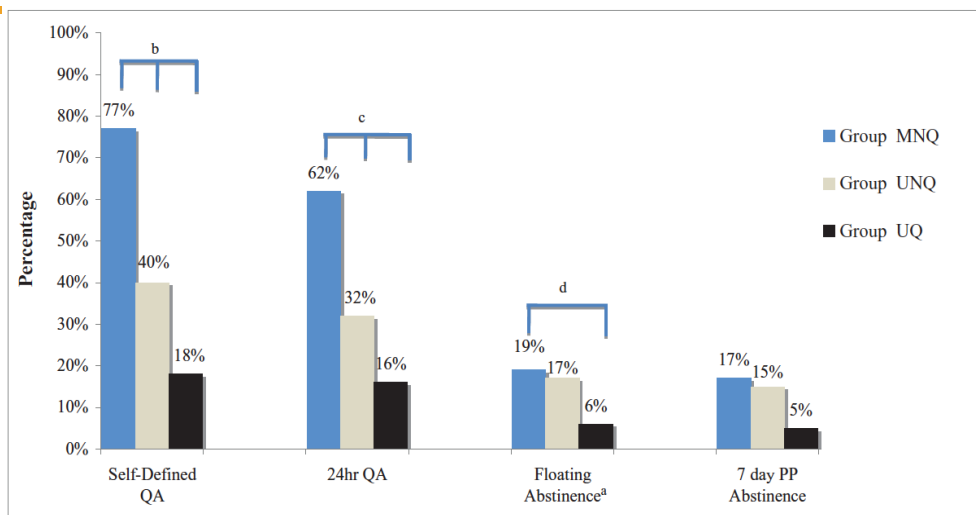


Active Treatment



Not Motivated to Quit

NRT Sampling – Part II



^a across intervention period; ^b $p \leq .01$; ^c $p < .01$; ^d $p = .04$

MNQ:

- Smokers Motivated to Quit
- Given 2 weeks supply of patch & lozenge
- Quitline referral

UNQ:

- Smokers Not Motivated to Quit
- Given 2 weeks supply of patch & lozenge
- Quitline referral

UQ:

- Smokers Not Motivated to Quit
- Quitline referral

**Motivation matters (mostly to make a QA),
but is not required (particularly for success in QA)**

NRT Sampling – Part III

Get Real and Go Big



Cluster Randomized Controlled Trial

Standard Care (SC): naturalistic, unscripted physician advice per routine

SC + NRT: 2 week supply of both nicotine patch & lozenge (uniform dosing)

22 primary care clinics across South Carolina

12 SC clinics (2 poor performing clinics replaced) & 10 NRT clinics

All study procedures (screening, consenting, baseline assessment, treatment delivery) done by clinic staff; No research staff present

All clinics given 1x 60-90min overview of USPHS Guidelines upon study start

All providers were encouraged to deliver cessation advice as done typically
“baggies” given to all smokers in all clinics with cessation materials; +/-
NRT

Bright idea in dentist's office leads to innovative smoking cessation project

[Staff Report](#) | February 03, 2020



Dr. Matthew Carpenter shows off the smoking cessation goody bag that helped people quit smoking. Photo by Dawn Brazzel



NRT Sampling – Part III

Get Real and Go Big



Final N = 1245 adult smokers, seen during routine clinic visit

- Broad inclusion criteria
- MTQ not required, nor willingness to sample cessation medication
- Follow-up thru 6 months, managed centrally by research staff via phone

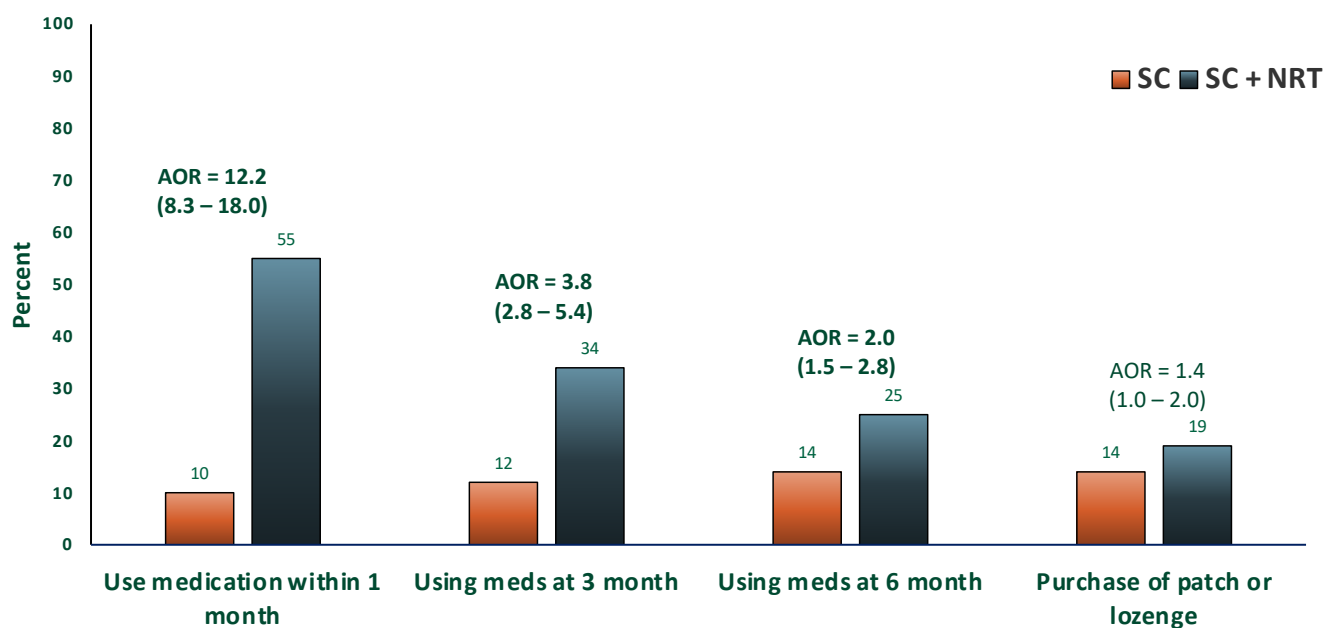
Methods: Dahne et al. 2018. Contemporary Clinical Trials; 72:1-7.

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NRT Sampling – Part III: TIP TOP

Medication Usage

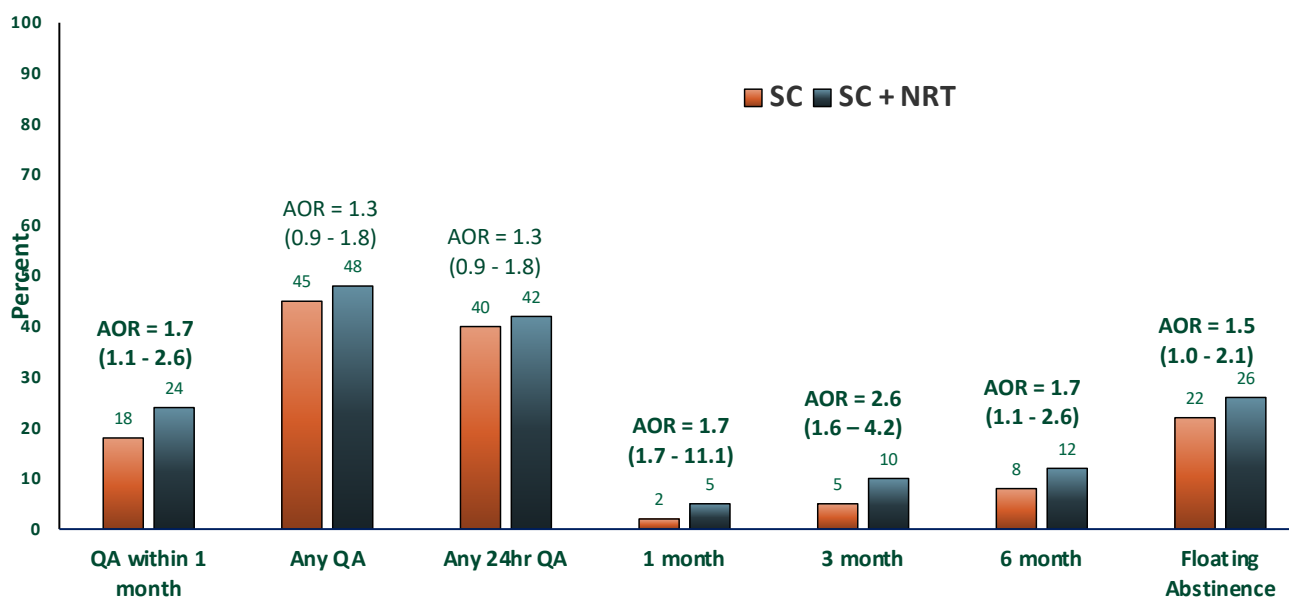


AOR adjusting for: a) site, b) nicotine dependence [Heaviness of Smoking Index], c) gender, and d) race.

Carpenter et al. 2020. Addiction; 115:1358-1367.

NRT Sampling – Part III: TIP TOP

Quit Attempts and Cessation



AOR adjusting for: a) site, b) nicotine dependence [Heaviness of Smoking Index], c) gender, and d) race. QA = Quit Attempt. Abstinence = 7-day self-reported not smoking, either Point Prevalence (1, 3, 6 months), or ever within follow-up period [floating].

Carpenter et al. 2020. *Addiction*; 115:1358-1367.

NRT Sampling – Part III: TIP TOP

Sensitivity Comparisons of Cessation-Related Outcomes by Baseline Motivation to Quit



	Low Motivation to Quit (n=573)			High Motivation to Quit (n=671)		
	<u>SC</u> <u>(n=315)</u>	<u>SC + NRT</u> <u>(n=258)</u>	<u>AOR</u>	<u>SC</u> <u>(n=336)</u>	<u>SC + NRT</u> <u>(n=335)</u>	<u>AOR</u>
Any QA	109 (35%)	94 (36%)	1.2	186 (55%)	193 (58%)	1.2
Any 24hr QA	92 (29%)	78 (30%)	1.2	166 (49%)	171 (51%)	1.2
Abstinence, 6 months	15 (5%)	20 (8%)	1.7	37 (11%)	50 (15%)	1.5
Floating Abstinence	44 (14%)	47 (18%)	1.6	97 (29%)	105 (31%)	1.3

To Note:

1. All sub-group treatment comparisons non-significant (dimin. power)
2. Absolute QA & Abstinence rates: HMTQ > LMTQ
3. All treatment effect sizes: LMTQ \geq HMTQ

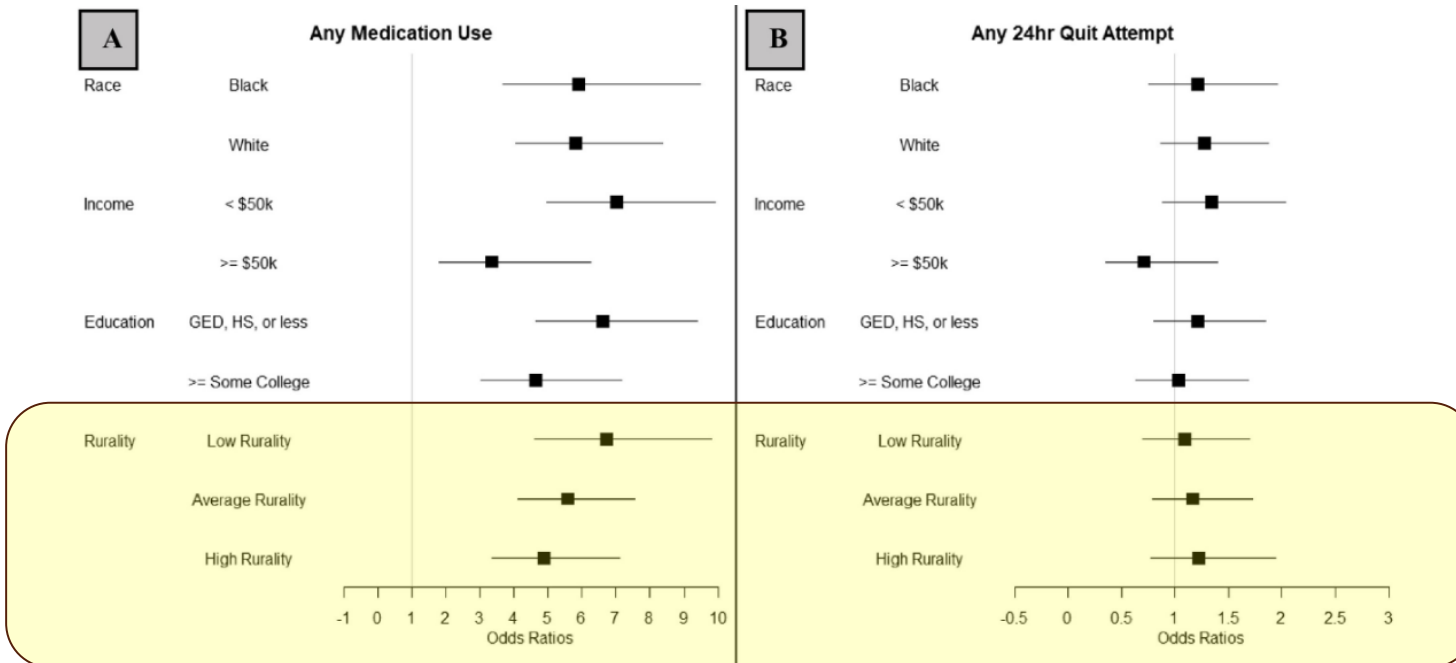
NRT Sampling – Big Picture



Two-Week NRT sampling:

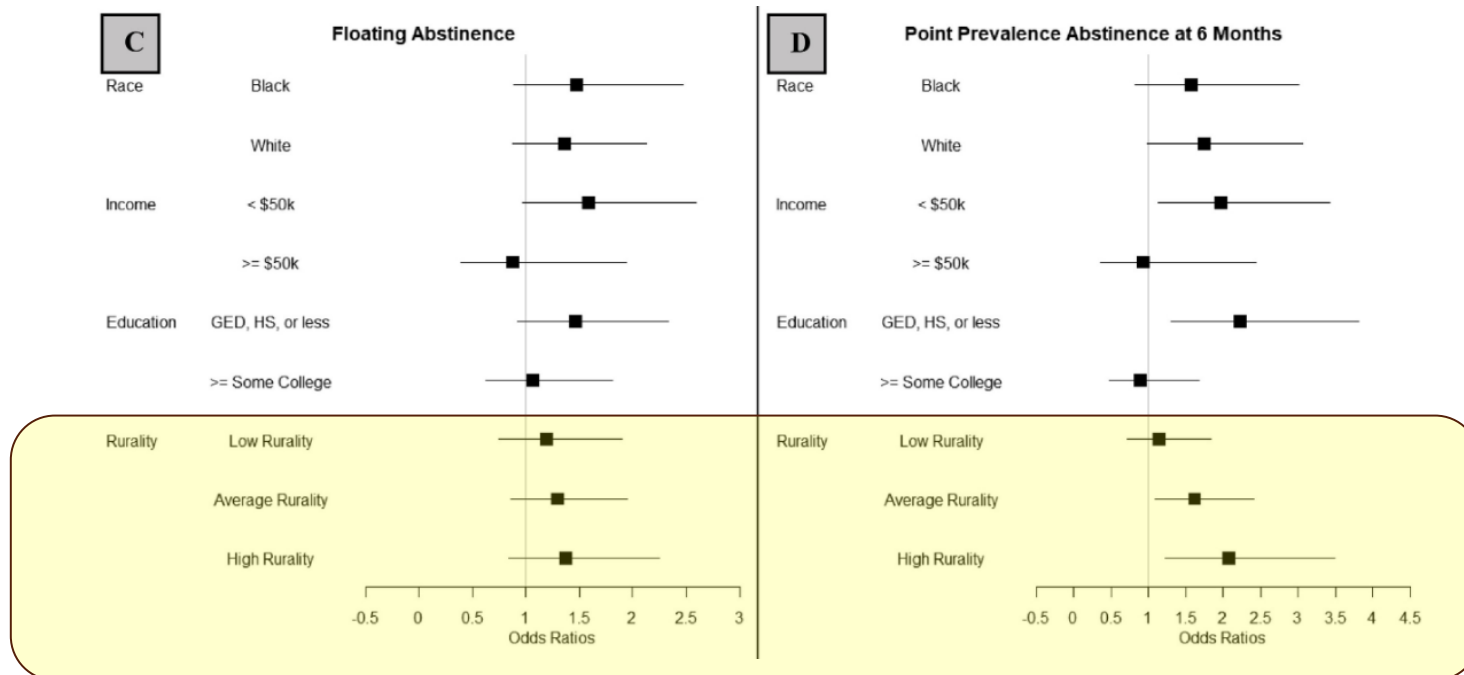
- Resulted in fairly low cessation outcomes
- Will not be a panacea for smoking cessation
- Does not replace comprehensive/intensive tx fitting for chronic relapsing d/o
- Would be strengthened by biochemical verification (unnecessary for non-intensive interventions?)

NRT Sampling: Differential Impact Across Disparity Groups



Dahne, Wahlquist, Smith, and Carpetner 2020. Preventive Medicine; 136:106096.

NRT Sampling: Differential Impact Across Disparity Groups



Dahne, Wahlquist, Smith, and Carpetner 2020. Preventive Medicine; 136:106096.

NRT Sampling – Big Picture



But it also . . .

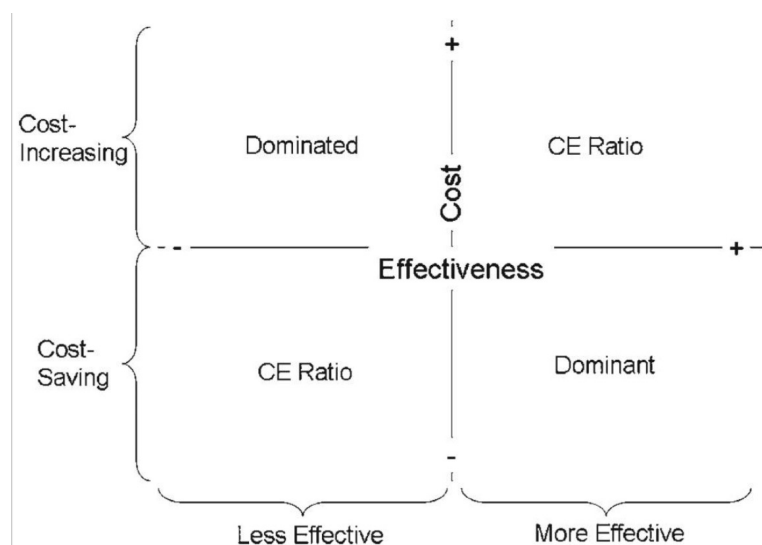
- Still outperformed standard care
- Offers strong potential for reach in busy clinical practices
 - few minutes to deliver
 - behavioral, concrete, and immediately actionable (vs. MI or brief advice- verbal)
 - minimal instructions or training needed, for both providers and patients
 - can be given to broad spectrum of smokers
- Cost effectiveness to be determined, but
 - nominally expensive treatment (~\$60 for 2wks of combo NRT)
 - \$150/QA; \$475/quit (similar to quitline give-away programs)
 - nominal adjunctive costs for the clinic
 - reasonable to believe that sampling could be cost effective

NRT Sampling

Cost Effectiveness: Quick Crash Course



**Cost of Treatment
Relative to Control**



Efficacy of Treatment Relative to Control

When a new intervention is both clinically inferior and cost increasing, it is referred to as a **“dominated”** strategy. Few novel technologies will fall here.

When a new strategy adds both benefits and costs (**upper right-hand quadrant**) or reduces both (**lower left-hand quadrant**), a **Cost Effective** ratio must be calculated to **judge benefits relative to costs**.

When a new intervention is both clinically superior and cost saving, it is referred to as an economically **“dominant”** strategy. **This is where you want to be, but few novel technologies will fall here.**



NRT Sampling

Cost Effectiveness



	Our Study: One and Done		
	NRT Sampling	Standard Care	Difference
Cost			
Cost of NRT Sampling	\$75	\$0	\$75
Discounted cost of subsequent health care	\$299,061	\$301,200	-\$2,139
Total discounted cost	\$299,136	\$301,200	-\$2,064
Outcomes			
Discounted Life Years	16.815	16.795	0.020
Discounted Quality Adjusted Life Years	13.065	13.046	0.019
Incremental Cost-Effectiveness Ratio (ICER)			
\$/LY	N/A. NRT sampling is dominant		
\$/QALY	N/A. NRT sampling is dominant		

Methods: Dahne et al. 2018. *Contemporary Clinical Trials*; 72:1-7.

Outcomes: Carpenter et al (2020). *Addiction*; 115: 1358-1367.

Cost Effectiveness: Chen et al J. *General Internal Medicine*; 37:3684-3691





NRT Sampling

Cost Effectiveness



	Our Study: One and Done			Hypothetical: 50% of smokers reissued NRT samples each quarter, for 6 months			Hypothetical: 50% of smokers reissued NRT samples each quarter, for 12 months		
	NRT Sampling	Standard Care	Difference	NRT Sampling	Standard Care	Difference	NRT Sampling	Standard Care	Difference
Cost									
Cost of NRT Sampling	\$75	\$0	\$75	\$172	\$0	\$172	\$232	\$0	\$232
Discounted cost of subsequent health care	\$299,061	\$301,200	-\$2,139	\$299,156	\$302,431	-\$3,275	\$298,458	\$302,431	-\$3,973
Total discounted cost	\$299,136	\$301,200	-\$2,064	\$299,328	\$302,431	-\$3,103	\$298,690	\$302,431	-\$3,741
Outcomes									
Discounted Life Years	16.815	16.795	0.020	16.879	16.851	0.028	16.885	16.851	0.034
Discounted Quality Adjusted Life Years	13.065	13.046	0.019	13.114	13.084	0.029	13.120	13.084	0.036
Incremental Cost-Effectiveness Ratio (ICER)									
\$/LY	N/A. NRT sampling is dominant			N/A. NRT sampling is dominant			N/A. NRT sampling is dominant		
\$/QALY	N/A. NRT sampling is dominant			N/A. NRT sampling is dominant			N/A. NRT sampling is dominant		

Methods: Dahne et al. 2018. *Contemporary Clinical Trials*; 72:1-7.

Outcomes: Carpenter et al (2020). *Addiction*; 115: 1358-1367.

Cost Effectiveness: Chen et al J. *General Internal Medicine*; 37:3684-3691



Medication Sampling – Part IV

Can smokers sample varenicline?

Sure!	Absolutely Not!
<ul style="list-style-type: none">• It's our best single agent option for cessation• Possibility of OTC switch• Lots of studies have shown VRN for unmotivated smokers, flexible dosing, pre-quit, etc• EAGLES trial → safe• Worth testing!	<ul style="list-style-type: none">• Rx medication; need oversight by clinician• Complicated titration• Ad libitum use may be inactive use?• Enduring concerns of safety• Worth testing?



A Pilot Clinical Trial of Remote Varenicline Sampling: DESIGN

- Adult smokers (n=99) recruited across South Carolina within remote clinical trial design
- Purposeful recruitment of smokers both wanting and not wanting to quit (stratified randomization)
- Smokers receiving varenicline sampling received 1x supply of 56 tablets (0.5mg), with suggestive but not required instructions on use/titration

"You are not required to take varenicline as part of this study. It is completely up to you if and how you take this medication."

"Each pill provided to you is 0.5mg. If you choose to try varenicline, start with taking one pill daily for 3 days. After the third day, take two pills each day, one in the morning and one in the evening. Several studies show that this 1mg daily dose helps smokers quit, and results in fewer side effects. After a week of starting varenicline, you may want to increase to a stronger dose. If so, you can take up to two pills in the morning and two more pills in the evening (total of four pills/2mg daily)."

"If you want more varenicline: We hope this starter kit helps you. After using it, we hope that you continue to use it, for as long as necessary. Talk to your doctor about getting more."

Thus, we viewed the sampling experience as lasting 2-4 weeks depending on participant choice

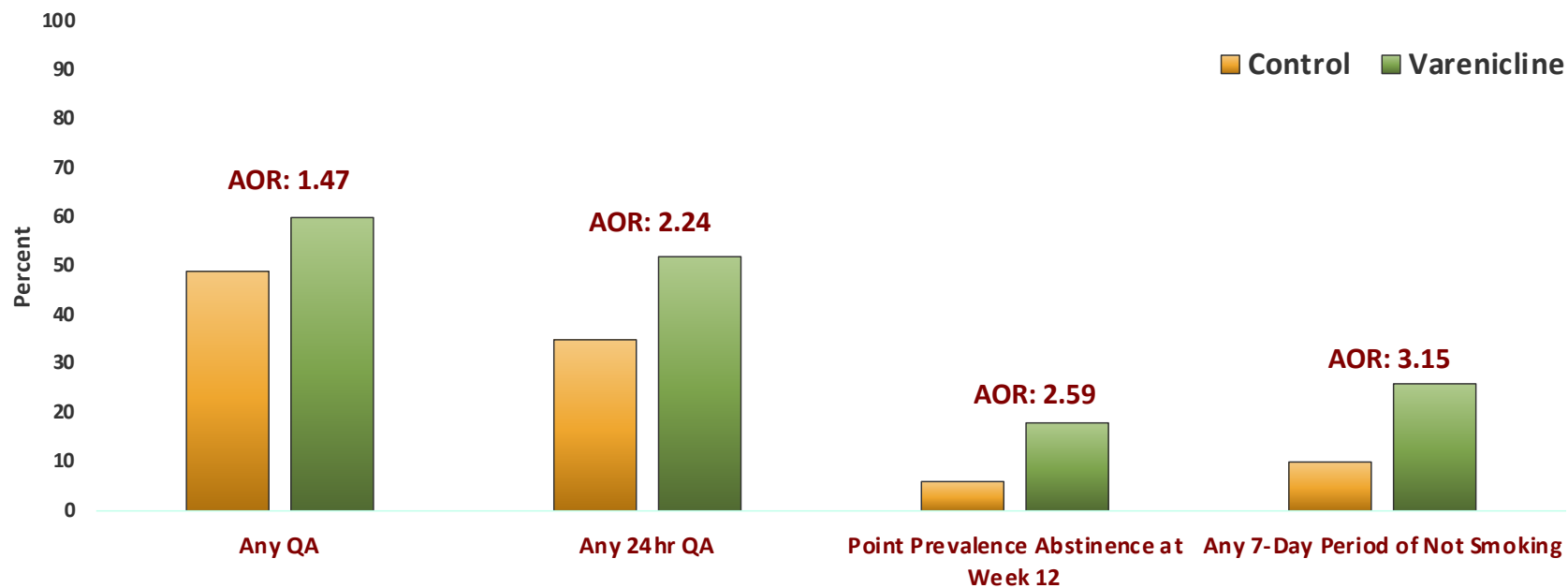
- No direct intervention from clinician, though clinician oversight was throughout
- Outcomes assessed through 12 weeks of follow-up: uptake, safety, behavioral outcomes

Carpenter et al (2021). *Nicotine & Tobacco Research*; 23: 983-991.

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A Pilot Clinical Trial of Remote Varenicline Sampling: Cessation Outcomes



Carpenter et al (2021). *Nicotine & Tobacco Research*; 23: 983-991.



Next Steps: Medication Sampling

Varenicline sampling, in a remote context, with minimal/suggestive guidance on use, is . . .

- Feasible: uptake was strong
- Safe: incidence and clinical severity of these adverse events were in line with prior trials, with no serious adverse events
- Likely beneficial: all cessation-related (and reductions in smoking) were numerically if not statistically in favor of sampling
- Worth testing in a larger trial (R01CA246729; PI: M. Carpenter)

And may have implications . . .

- Clinical: scalable, practical application into any number of clinical settings (primary care, community mental health, others)
- Regulatory: supportive of alternative delivery modalities for varenicline

Go Big or Go Home: Ongoing RCT of VRN vs. NRT vs. No Sampling (N=640): R01 CA46729.

And Get a logo





Potential Population Impact of Medication Sampling (over a six month period)

	Current Evidence	Medication Sampling
Probability (P) of Quit Attempt (x)	.28	.5
(P) of Using Evidence-Based Quit Method (y)	.25	.65
(P) Success Per Method (z)	.25	.1
Impact: Population Quit Rate (x*y*z)	1.75%	3.25 %

Medication sampling is not about new treatments.
Medication sampling is likely less effective than more intense treatment.

Don't be fooled by low numbers!
It's about getting more smokers to use better treatments, sooner.
This is the Significance.



Wrapping it All Up

Medication sampling:

- Has low quit rates
- Will never replace more the need for more intensive and sustained treatments
- Constrained by lack of biological verification

But also . . .

- Is scalable, pragmatic, and cheap: <\$100 and ~1 minute to deliver
- Prompts continued use of the product
- Prompts quit attempts and cessation, and promote reduction
- Is not specific to only those who want to quit (vs. quitline?)
- Is super lay-friendly
- Not just cost-effective, but cost savings
- **And is therefore super disseminable**



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**Especially
Relevant for
Rural Smokers?**

What this Might Look Like in Rural Vermont?

Outside a clinic

1. Identify smokers from electronic health records.
2. (verify?)
3. Send packet in the mail, with accompanying rationale, info, etc.
4. Provide instructions (vouchers?) to receive more.
5. Follow-up to determine outcome, or document at next office visit.

Eligibility:
All adult smokers
Regardless of MTQ

Within a clinic

1. Confirm smoking status during patient visit.
2. Provide standard cessation advice, as advised from practice guidelines.
3. During or after that conversation, provide NRT and provide rationale.
4. Provide instructions (vouchers?) to receive more.
5. Follow-up to determine outcome, or document at next office visit.

Or chart your own path forward.



Even in Rural Areas . . . It takes a Village

Funding

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Hollings Cancer Center

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Thank you.
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Thank you!
Questions?

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