Outcomes of Smoking Cessation Treatment After a Cancer Diagnosis

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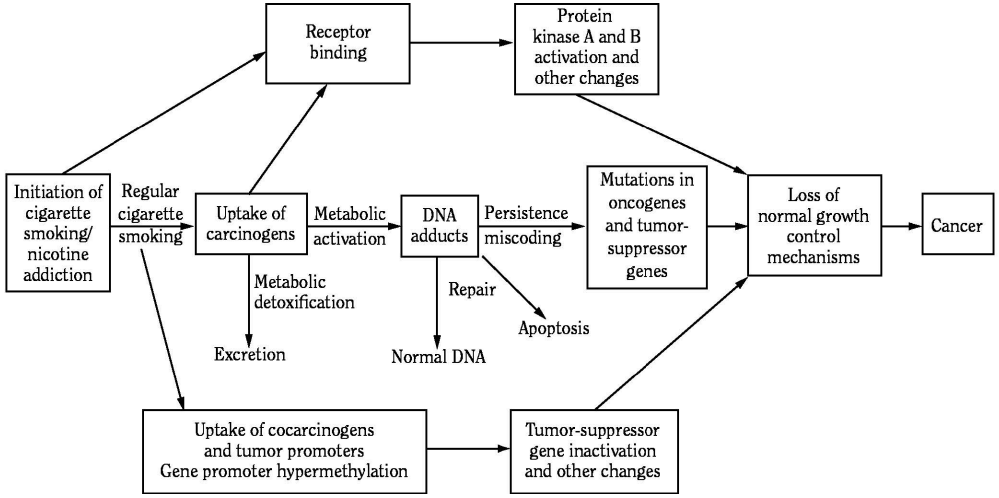
Problem: We don't view Smoking in the Continuum of Cancer

The Established Carcinogenesis Model

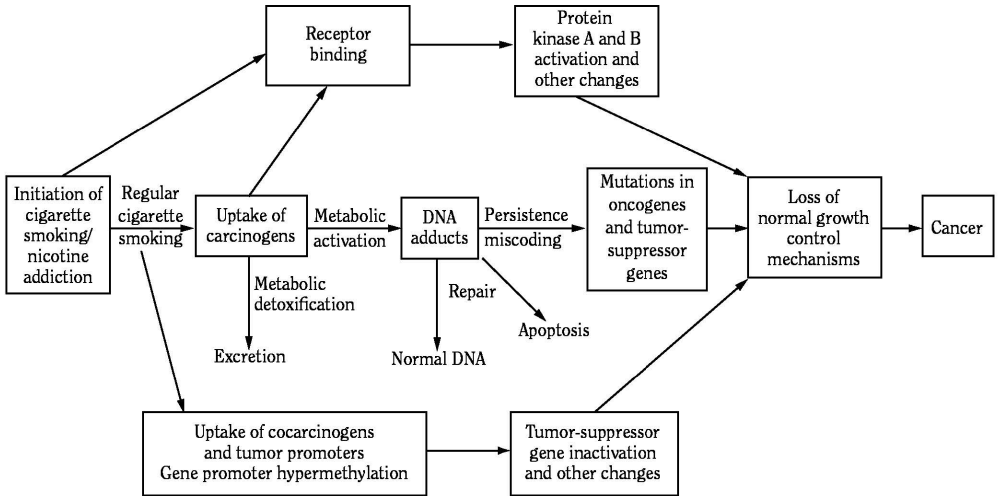


2010 Surgeon General's Report, Fig 5.1

Problem: We don't view Smoking in the Continuum of Cancer

The Historical Disconnect

The Established Carcinogenesis Model



2010 Surgeon General's Report, Fig 5.1

The Reality of Cancer

Biologic Outcomes
(tumor promotion, decreased cancer treatment efficacy)

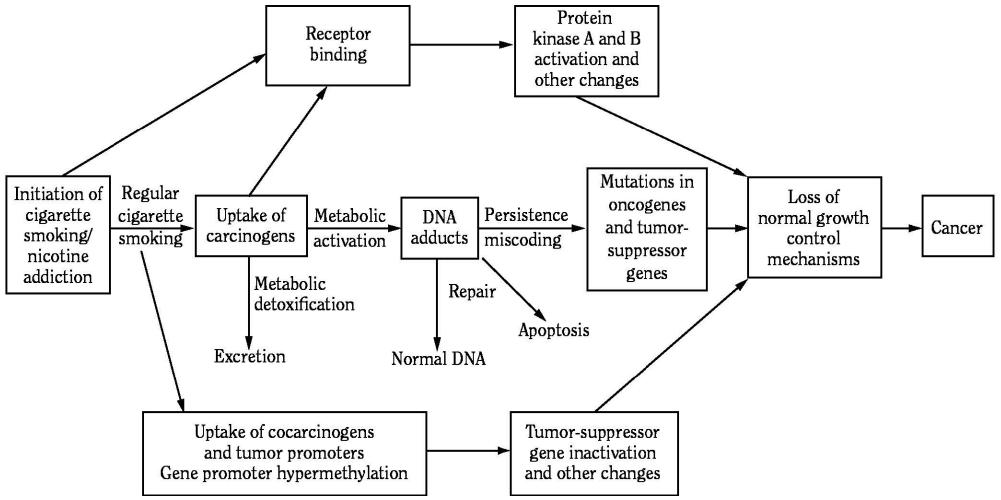
Clinical Outcomes
(recurrence, toxicity, mortality)

Value Outcomes
(cost of cancer treatment, productivity, QOL/EOL, recurrence, toxicity, mortality)

Problem: We don't view Smoking in the Continuum of Cancer

~~The Historical Disconnect~~

The Established Carcinogenesis Model



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Addressing Tobacco Use by Cancer Patients

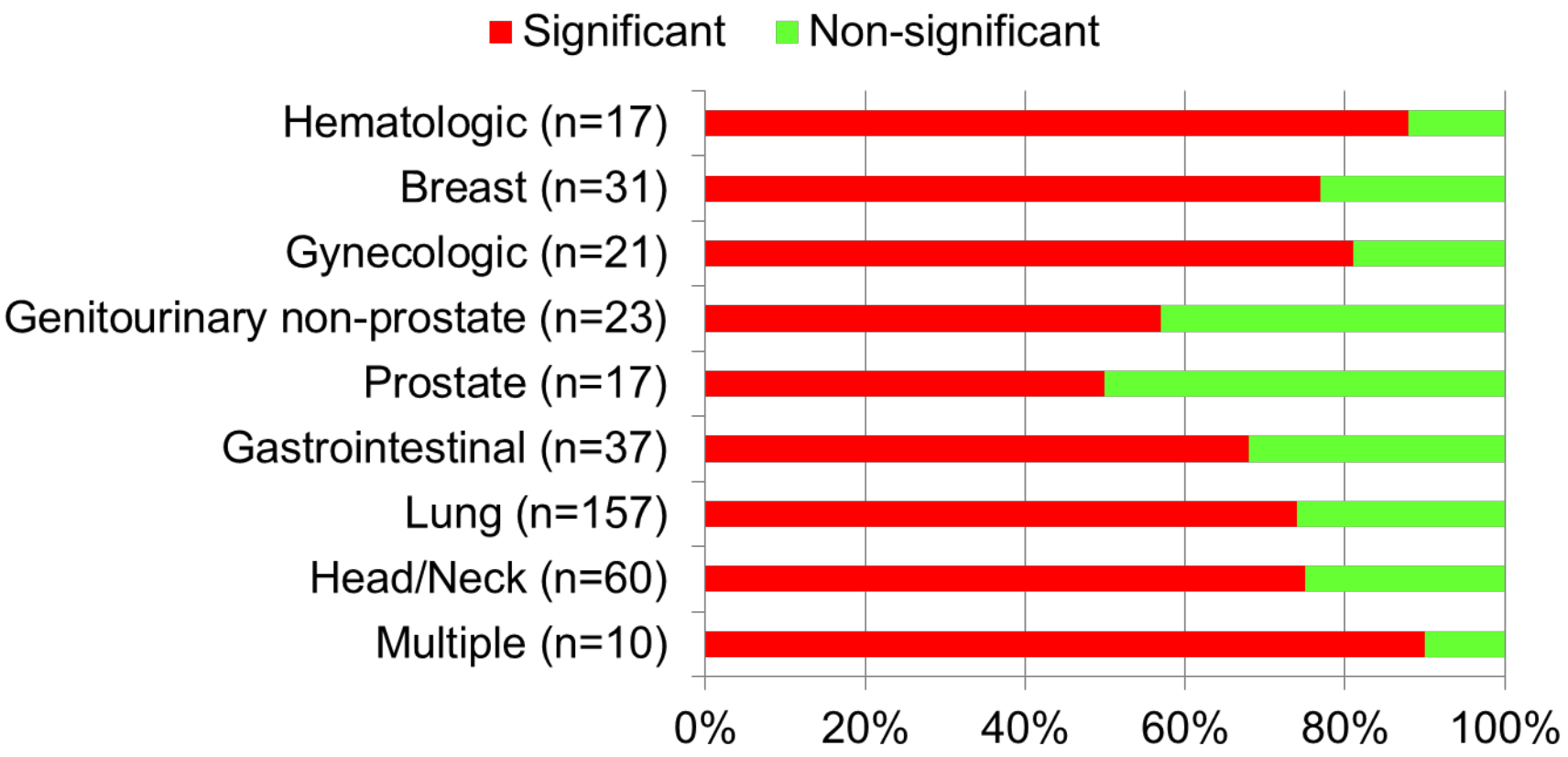
The 2014 SGR: Magnitude Estimates

Effect	Studies	Associations (Significant)	RR Magnitude (median)
Overall Mortality	159	87% (62%)	**Current: 1.51** Former: 1.22
Overall Survival	62	77% (42%)	
Cancer Related Mortality	58	79% (59%)	**Current: 1.61** Former: 1.03
Second Primary	26	100% (100%)	
Recurrence	51	82% (53%)	**Current:1.42** Former:1.15
Response	16	72%	
Toxicity	82	94% (80%)	

U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.

Breadth of Association across Cancer

(one or more negative association)



U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.

Cost of Failure due to Smoking

Table 3. Mean Cost Associated With First-line Cancer Treatment Failure Attributed to Smoking per 1000 Total Patients With a 30% Failure Rate of First-line Cancer Treatment Among Nonsmoking Patients and 20% Smoking Prevalence

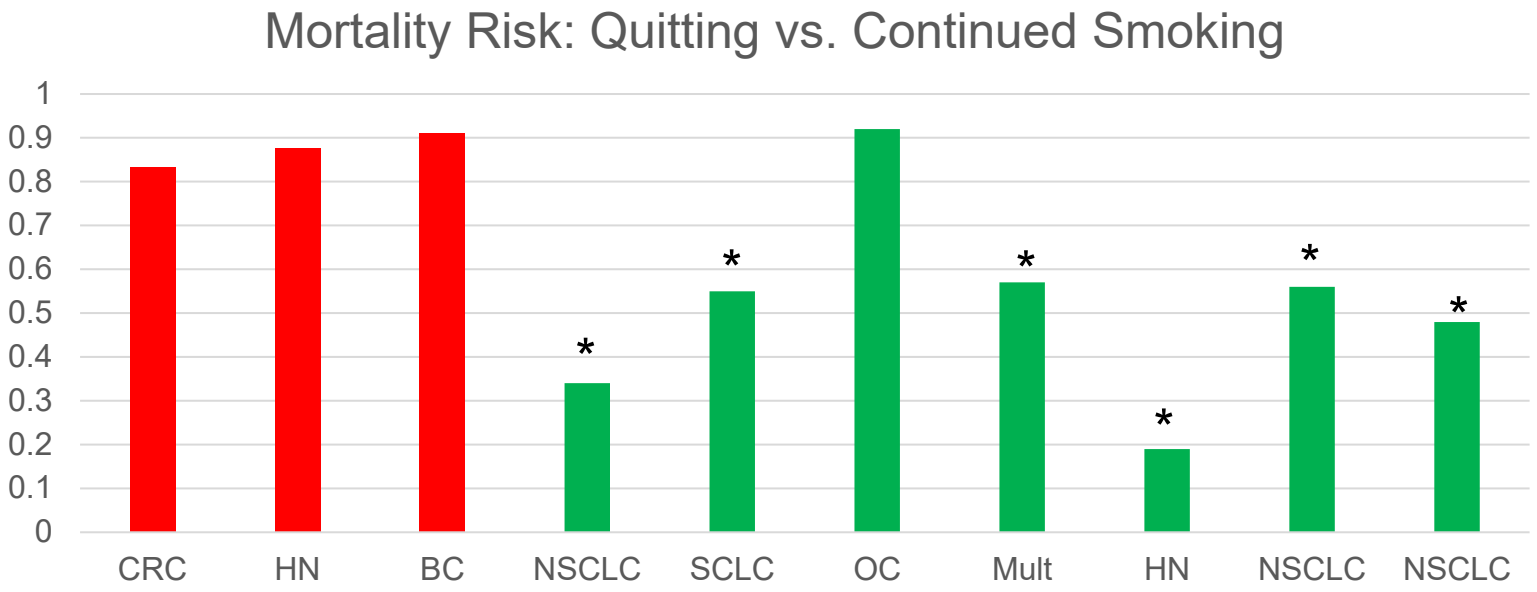
	Mean Individual Cost per Treatment Failure, $			
Odds Ratio[a]	10 000	50 000	100 000	250 000
1.1	40 777	203 883	407 767	1 019 417
1.2	79 245	396 226	792 453	1 981 132
1.4	150 000	750 000	1 500 000	3 750 000
1.6	213 559	1 067 797	2 135 593	5 338 983
1.8	270 968	1 354 839	2 709 677	6 774 194
2.0	323 077	1 615 385	3 230 769	8 076 923
2.5	434 483	2 172 414	4 344 828	10 862 069
3.0	525 000	2 625 000	5 250 000	13 125 000

US Estimates (2019): $3.4 Billion Annually

Pan-Canadian Estimates (2019): $239 Million Annually

Warren et al., JAMA Network Open, 2019
Irragori et al. Curr Oncol 2021

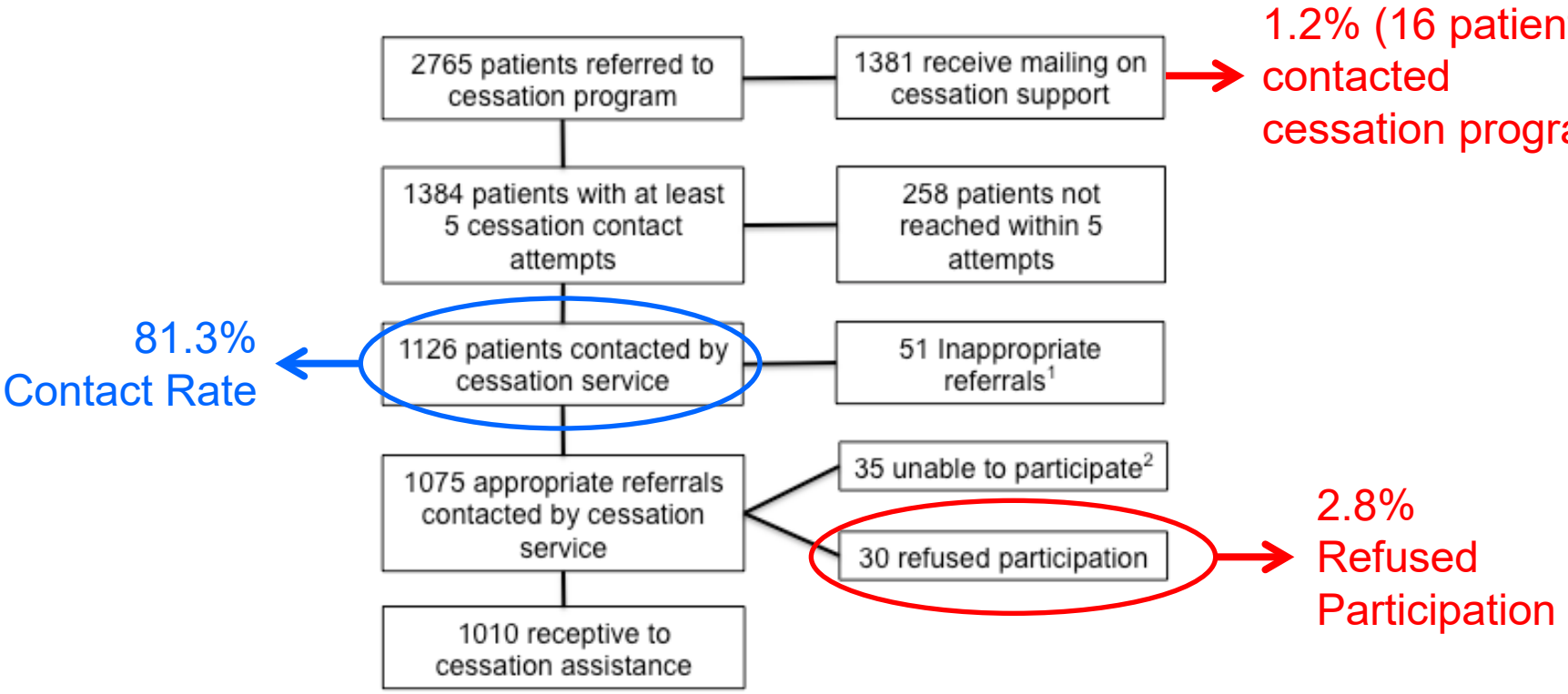
What if People Quit After Diagnosis?



- 3 studies compared vs. never smoking
- In 7 studies comparing quitting vs. continued smoking
  - 6 showed significant reductions in mortality with quitting
  - **45% median reduction in mortality with quitting**

U.S. Department of Health and Human Services. Smoking Cesstion: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2020.

Participation at First Cessation Contact



1. Includes 12 never smokers and 39 former smokers with no tobacco use in the past 30 days
2. Includes 12 patients in end-of-life situation and 23 patients in assisted living arrangement with contact by proxy

Warren GW et al., *Cancer* 2014

New Patient Screen Yield

98.8% of patients captured with 3 questions

Referral Question	% of Total Referrals for Current Users	% of Total Referrals for Former Users	% of Total Referrals
Do you now smoke cigarettes everyday, some days, or not at all?	93.7%		**83.1%**
Do you currently use any other tobacco products such as cigars, pipes, chewing tobacco, snuff, dip, SNUS, clove cigarettes, kreteks, or bidis?	6.3%		**5.6%**
About how long has it been since you last smoked a cigarette, even a puff?		89.0%	**10.1%**
About how long has it been since you last smoked/used other tobacco products such as cigars, cigarillos, little cigars, pipe tobacco, or used chewing tobacco, snuff, dip, or SNUS even once?		1.4%	0.2%
Are you currently using any of the following methods or strategies to try to quit?		2.7%	0.3%
Are you interested in stopping tobacco use or speaking with our tobacco cessation specialist?		6.8%	0.8%

Extending assessment to every month delayed referral in only 3 of 428 cessation referrals (0.7%)

Warren GW et al., *Cancer* 2014

Opt-Out Cessation and Mortality

Continuous Variables	N	Mean	Hazard Ratio	95% CI	p
Age at diagnosis (years)	224	61.9	**1.04**	**1.02–1.06**	**0.001**
Pack-years	224	59.7	1.00	0.99–1.01	0.495
Days between diagnosis and last contact	224	100.9	0.999	0.998–1.001	0.227
Categorical Variables	**N**	**%**	**Hazard Ratio**	**95% CI**	**p**
Sex					
Female	134	59.8	1.00	Ref.	0.051
Male	90	40.2	1.45	1.01–2.14	
Clinical stage					
Stage I/II	81	36.2	**1.00**	**Ref.**	**<0.001†**
Stage III	65	29.0	**2.53**	**1.39–4.61**	
Stage IV	78	34.8	**8.72**	**4.93–15.40**	
ECOG status					
0	127	56.7	1.00	Ref.	0.265
≥1	97	43.3	1.26	0.84–1.89	
Tumor histology					
NSCLC	197	87.9	1.00	Ref.	0.626
Other lung cancer	27	12.1	0.87	0.50–1.52	
Quit status at referral					
Quit	48	21.4	1.00	Ref.	0.393
Current	176	78.6	0.80	0.48–1.34	
Quit status at last contact					
Quit	95	42.4	**1.00**	**Ref.**	**0.012†**
Current	129	57.6	**1.79**	**1.14–2.82**	

115 of 224 patients (51.3%) were deceased by the end of the follow-up period. The model is adjusted for all variables shown in this table based upon a Cox proportional hazards model.
*$N = 224$ of 250 due to 22 records missing clinical stage, two missing pack-years, and two missing both clinical stage and pack-years.
Bold indicates statistically significant at $p < 0.05$.
CI, confidence interval; ECOG, Eastern Cooperative Oncology Group; NSCLC, non–small-cell lung cancer.

44% reduction in mortality

Dobson-Amato et al., *J Thorac Oncol 2015*

Cessation after Diagnosis: A New Gold Standard

JAMA Oncology | Original Investigation

Survival Outcomes of an Early Smoking Cessation Treatment After a Cancer Diagnosis

October 31, 2024

Paul M. Cinciripini, George Kypriotakis, Janice A. Blalock, Maher Karam-Hage, Diane M. Beneventi, Jason D. Robinson, Jennifer A. Minnix, Graham W. Warren

Question: Does the timing of entry into a smoking cessation program after a cancer diagnosis influence overall survival?

JAMA Oncol. 2024;10(12):1689-1696. doi:10.1001/jamaoncol.2024.4890

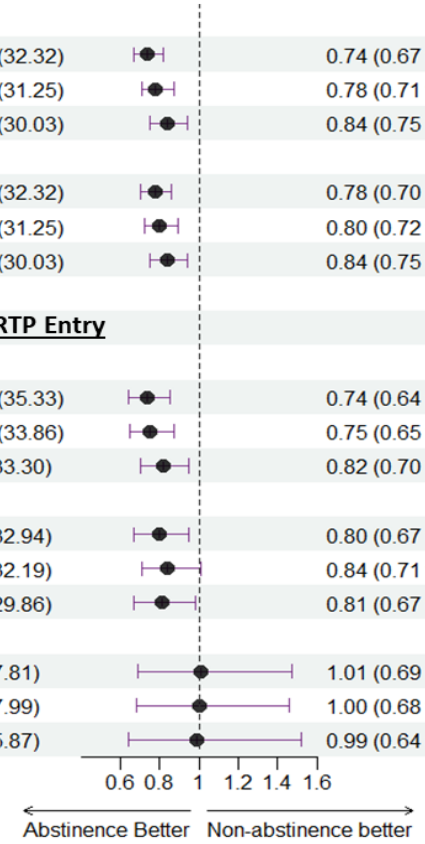
~25% Mortality Reduction with Early Cessation

ACROSS CANCER

(simple message for ALL patients)

No. of Deaths / No. of Patients (%)

Abstinence	Non-Abstinent	Abstinent	HR (95% CI)
Cancer (not adjusted for stage)			
3 Months	992 /2626 (37.78)	614 /1900 (32.32)	0.74 (0.67 to 0.82)
6 Months	906 /2581 (35.10)	566 /1811 (31.25)	0.78 (0.71 to 0.87)
9 Months	821 /2597 (31.61)	491 /1635 (30.03)	0.84 (0.75 to 0.94)
Cancer (stratified by stage)			
3 Months	992 /2626 (37.78)	614 /1900 (32.32)	0.78 (0.70 to 0.86)
6 Months	906 /2581 (35.10)	566 /1811 (31.25)	0.80 (0.72 to 0.89)
9 Months	821 /2597 (31.61)	491 /1635 (30.03)	0.84 (0.75 to 0.94)
Cancer Patients by Time Between Diagnosis and TRTP Entry			
< 6 mos			
3 Months	477 /1076 (44.33)	377 /1067 (35.33)	0.74 (0.64 to 0.85)
6 Months	434 /1049 (41.37)	345 /1019 (33.86)	0.75 (0.65 to 0.87)
9 Months	395 /1065 (37.09)	309 /928 (33.30)	0.82 (0.70 to 0.95)
6 mos - 5 yrs			
3 Months	435 /1117 (38.94)	193 /586 (32.94)	0.80 (0.67 to 0.95)
6 Months	396 /1096 (36.13)	178 /553 (32.19)	0.84 (0.71 to 1.01)
9 Months	355 /1080 (32.87)	149 /499 (29.86)	0.81 (0.67 to 0.98)
5 yrs +			
3 Months	80 /433 (18.48)	44 /247 (17.81)	1.01 (0.69 to 1.47)
6 Months	76 /436 (17.43)	43 /239 (17.99)	1.00 (0.68 to 1.46)
9 Months	71 /452 (15.71)	33 /208 (15.87)	0.99 (0.64 to 1.52)



This HRs are controlled for age, gender, race, time dx-TTP site and stratified by stage

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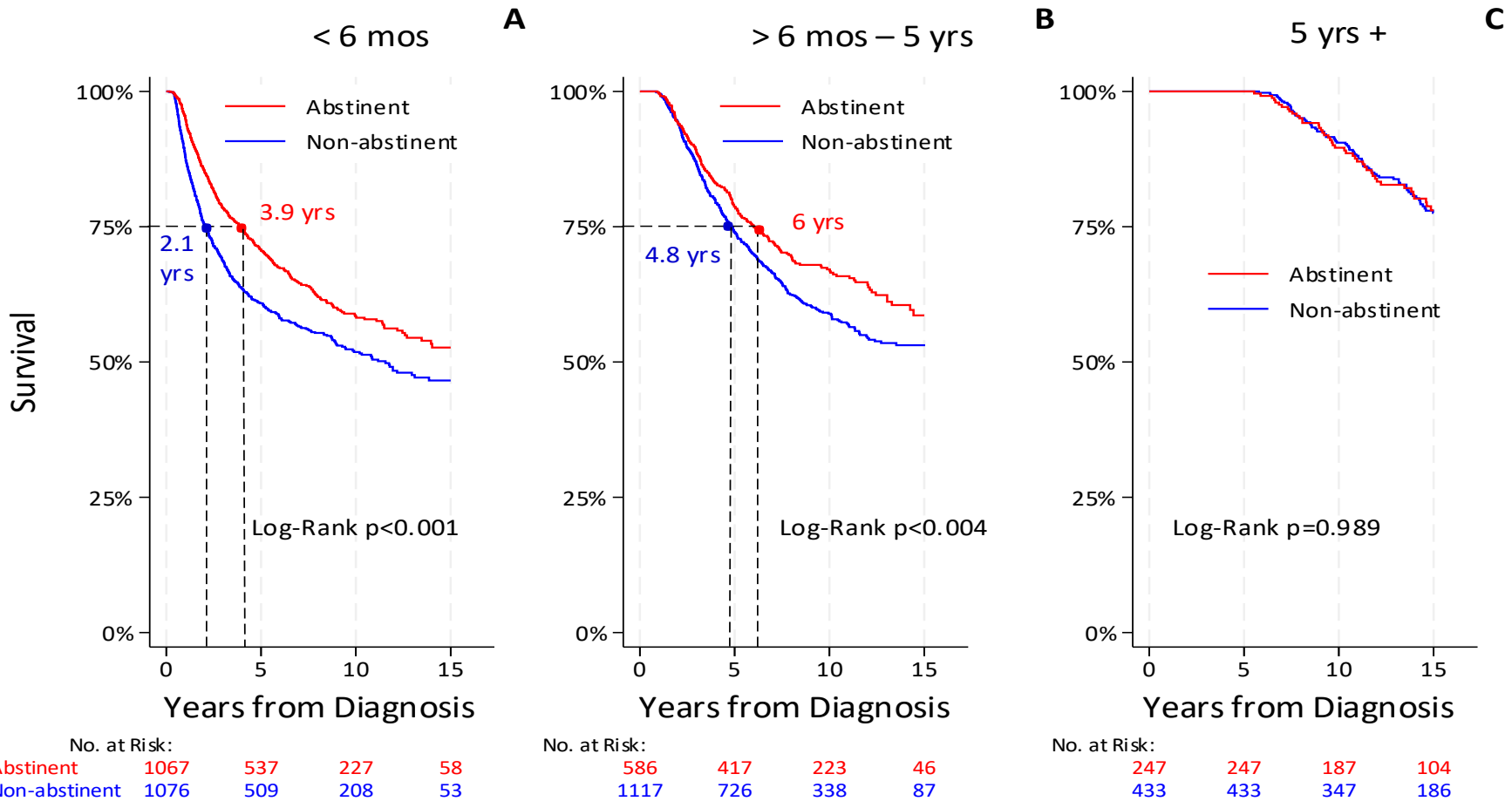
Get Patients into Tobacco Treatment ASAP after a Cancer Diagnosis (or during workup!)

TRTP within 6 months of dx adds 1.8+ years of life!!!



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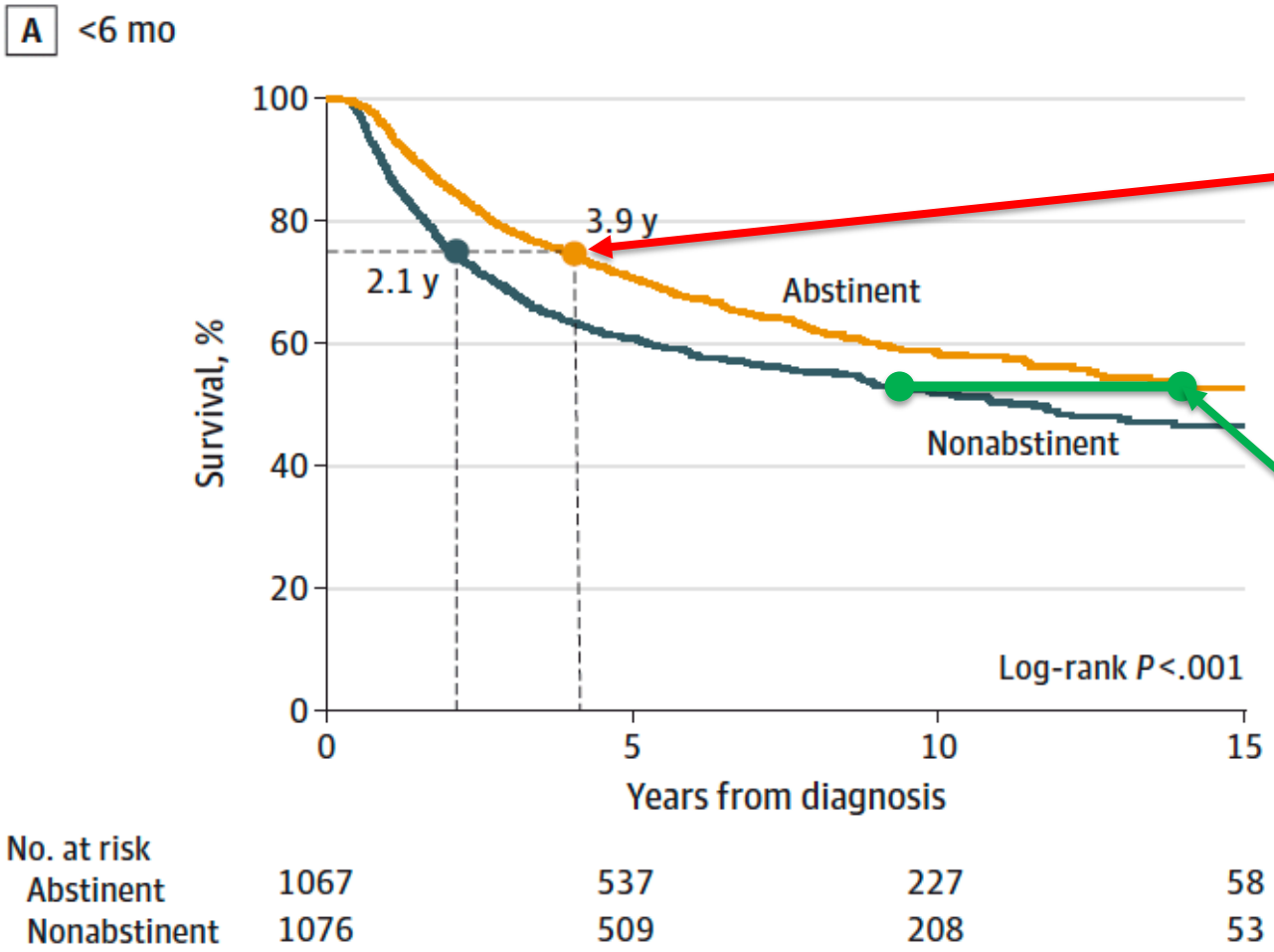
1.8 Years May Be Conservative…



1.8 years at 75th percentile

Approximately 4 years at 50th percentile

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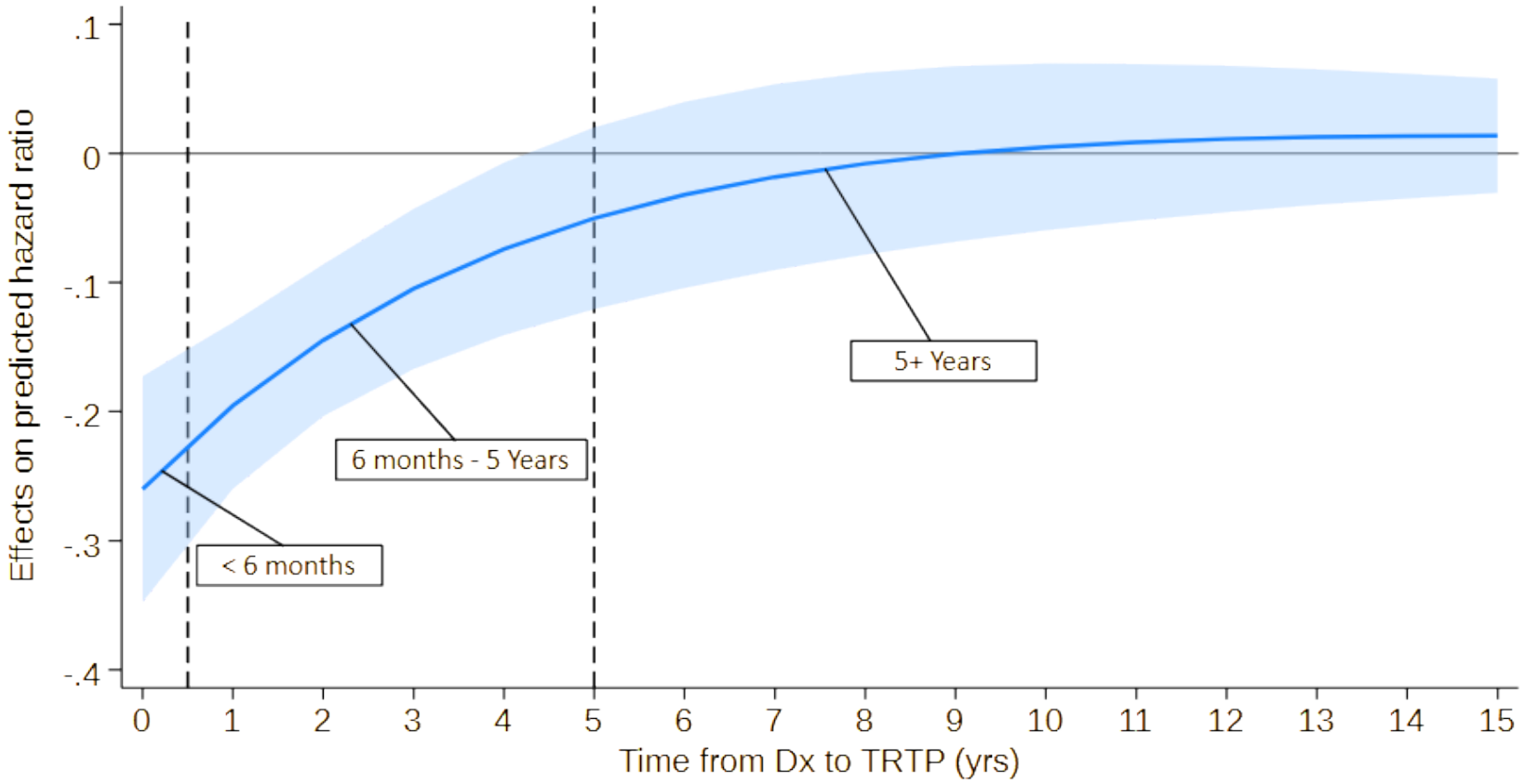
Survival Benefit vs. Time to Cessation Entry



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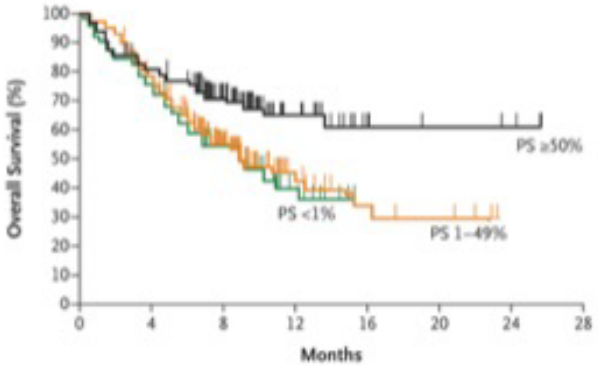
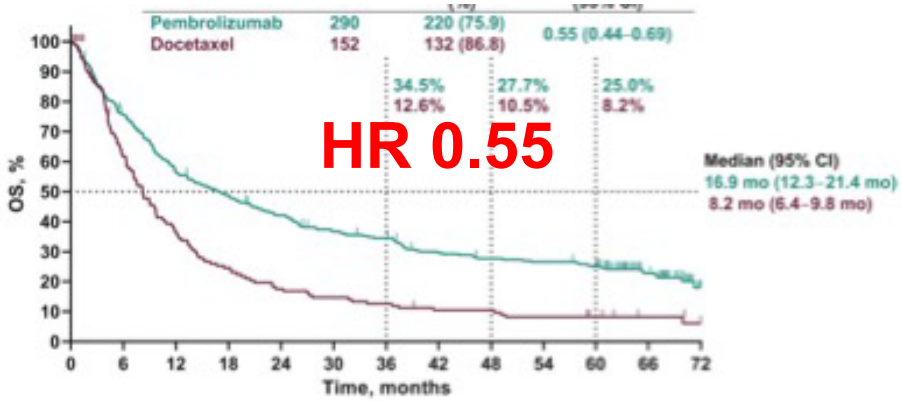
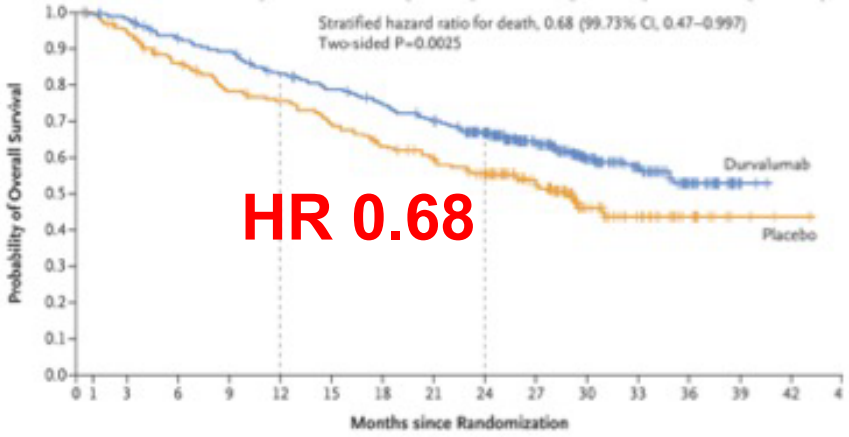
How Does Cessation Compare with Revolutions in Lung Cancer Care?



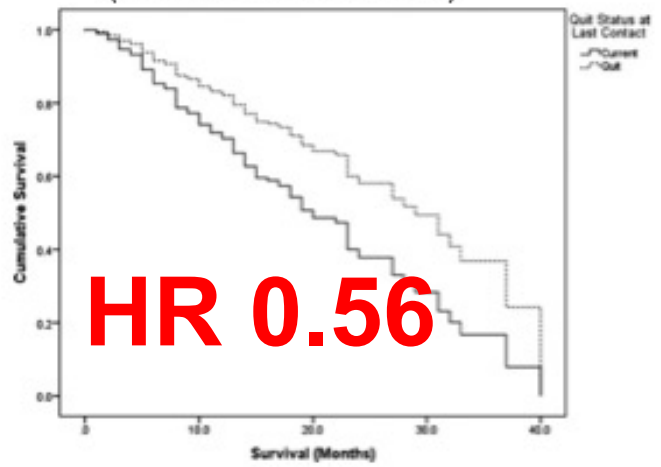
Overall Survival with Pembro by PD-L1 status, Keynote-001
(Garon et al. NEJM 2015)



Overall Survival with Pembro, PD-L1 >50 Keynote-010
(Herbst et al. JTO 2021)

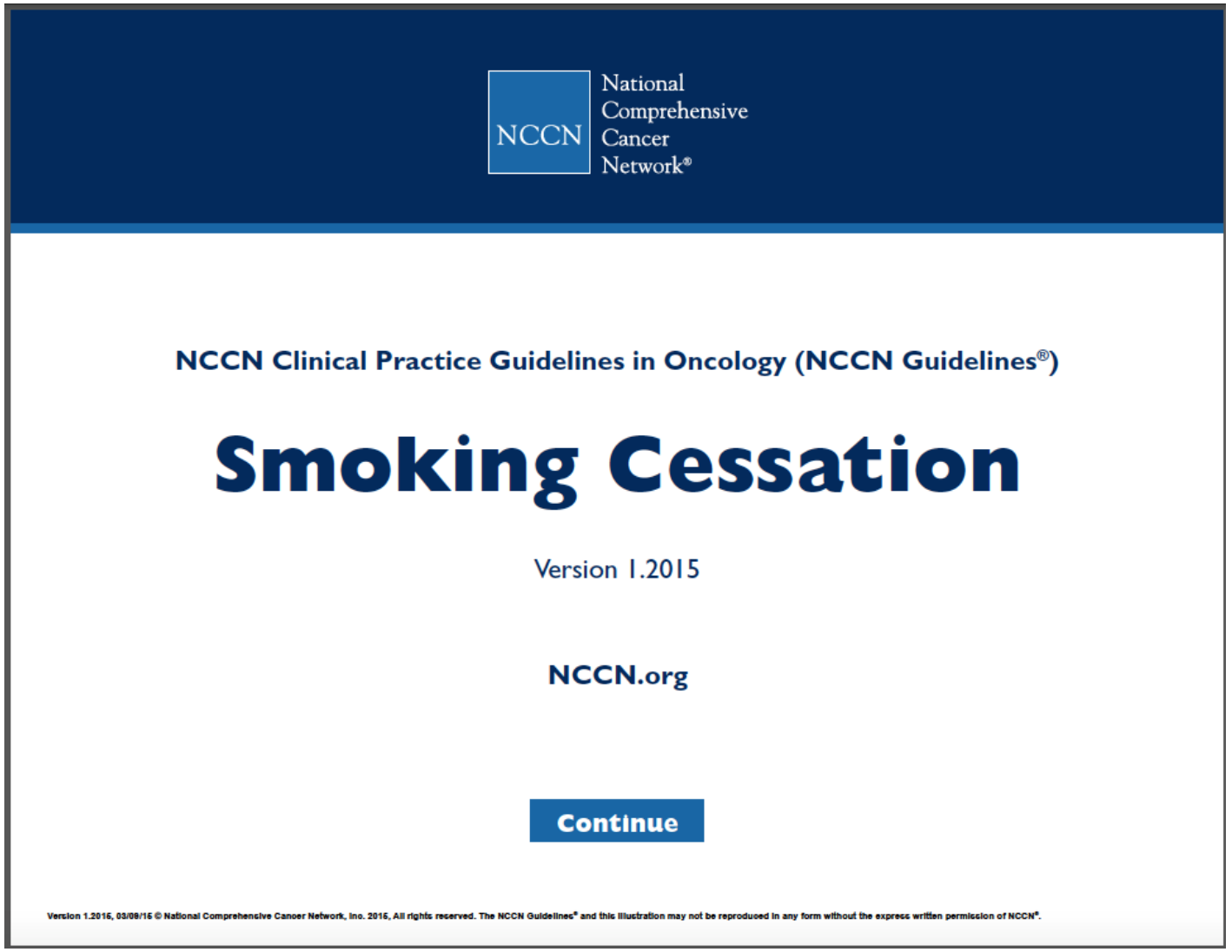


Overall Survival with Duvalumab, Pacific Trial
(Antonia et al. NEJM 2018)



Smoking Cessation added to first line NSCLC treatment
(Dobson-Amato et al. JTO 2015)

Resources: NCCN Guidelines



www.nccn.org (v1, 2015)

NCI/AACR Structured Questions

Published OnlineFirst February 17, 2016; DOI: 10.1158/1078-0432.CCR-16-0104

Special Report

Clinical Cancer Research

Research Priorities, Measures, and Recommendations for Assessment of Tobacco Use in Clinical Cancer Research

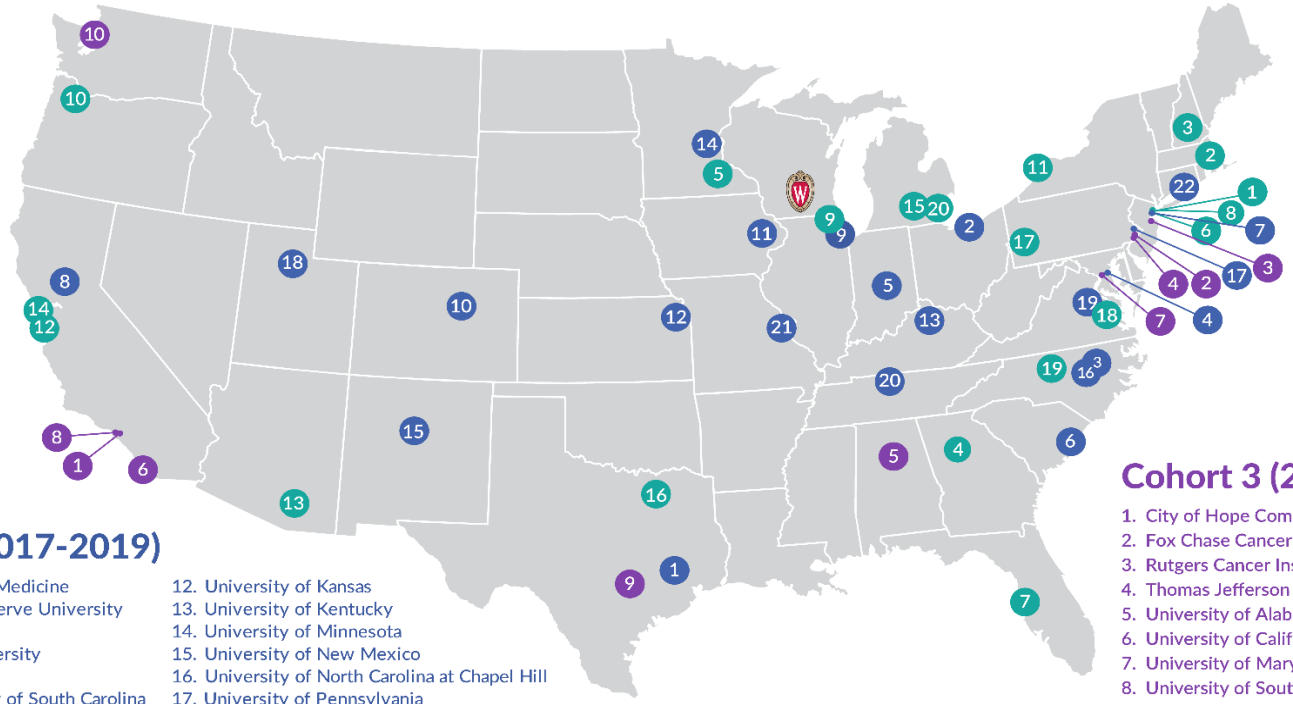
Stephanie R. Land[1], Benjamin A. Toll[2], Carol M. Moinpour[3], Sandra A. Mitchell[1], Jamie S. Ostroff[4], Dorothy K. Hatsukami[5], Sonia A. Duffy[6], Ellen R. Gritz[7], Nancy A. Rigotti[8], Thomas H. Brandon[9], Sheila A. Prindiville[10], Linda P. Sarna[11], Robert A. Schnoll[12], Roy S. Herbst[13], Paul M. Cinciripini[7], Scott J. Leischow[14], Carolyn M. Dresler[15], Michael C. Fiore[16], and Graham W. Warren[2,17,18]

Cognitive Testing of Tobacco Use Items for Administration to Patients with Cancer and Cancer Survivors in Clinical Research

Stephanie R. Land, PhD[1,2]; Graham W. Warren, MD, PhD[3,4]; Jennifer L. Crafts, PhD[5]; Dorothy K. Hatsukami, PhD[6]; Jamie S. Ostroff, PhD[7]; Gordon B. Willis, PhD[2]; Veronica Y. Chollette, RN, MS[2]; Sandra A. Mitchell, PhD, CRNP, AOCN[2]; Jasmine N. M. Folz, MA[5]; James L. Gulley, MD, PhD[8]; Eva Szabo, MD[9]; Thomas H. Brandon, PhD[10]; Sonia A. Duffy, PhD, RN[11]; and Benjamin A. Toll, PhD[12]

Land et al. *Clin Cancer Res* 2016
Land et al. *Cancer* 2016

Cancer Center Cessation Initiative (C3I) Funded Centers
Cohort 1, Cohort 2, and Cohort 3
Impact: over 95,000 patients between 2018-22



Cohort 1 (2017-2019)

1. Baylor College of Medicine
2. Case Western Reserve University
3. Duke University
4. Georgetown University
5. Indiana University
6. Medical University of South Carolina
7. New York University
8. University of California Davis
9. University of Chicago
10. University of Colorado
11. University of Iowa
12. University of Kansas
13. University of Kentucky
14. University of Minnesota
15. University of New Mexico
16. University of North Carolina at Chapel Hill
17. University of Pennsylvania
18. University of Utah
19. University of Virginia
20. Vanderbilt University
21. Washington University
22. Yale University

Cohort 2 (2018-2020)

1. Columbia University
2. Dana-Farber/Harvard Cancer Center
3. Dartmouth College
4. Emory University
5. Mayo Clinic
6. Memorial Sloan Kettering
7. Moffitt
8. Mount Sinai
9. Northwestern University
10. Oregon Health and Sciences University
11. Roswell Park
12. Stanford University
13. University of Arizona
14. University of California San Francisco
15. University of Michigan
16. University of Texas Southwestern
17. UPMC Hillman
18. Virginia Commonwealth University
19. Wake Forest University
20. Wayne State University

Cohort 3 (2020-2021)

1. City of Hope Comprehensive Cancer Center
2. Fox Chase Cancer Center
3. Rutgers Cancer Institute of New Jersey
4. Thomas Jefferson University
5. University of Alabama at Birmingham
6. University of California, San Diego
7. University of Maryland
8. University of Southern California
9. University of Texas
10. University of Washington

CANADIAN PARTNERSHIP AGAINST CANCER | PARTENARIAT CANADIEN CONTRE LE CANCER

10 years OF PROGRESS

Pan-Canadian Tobacco Cessation + Cancer Care Network

CPAC: Infrastructure Outcomes

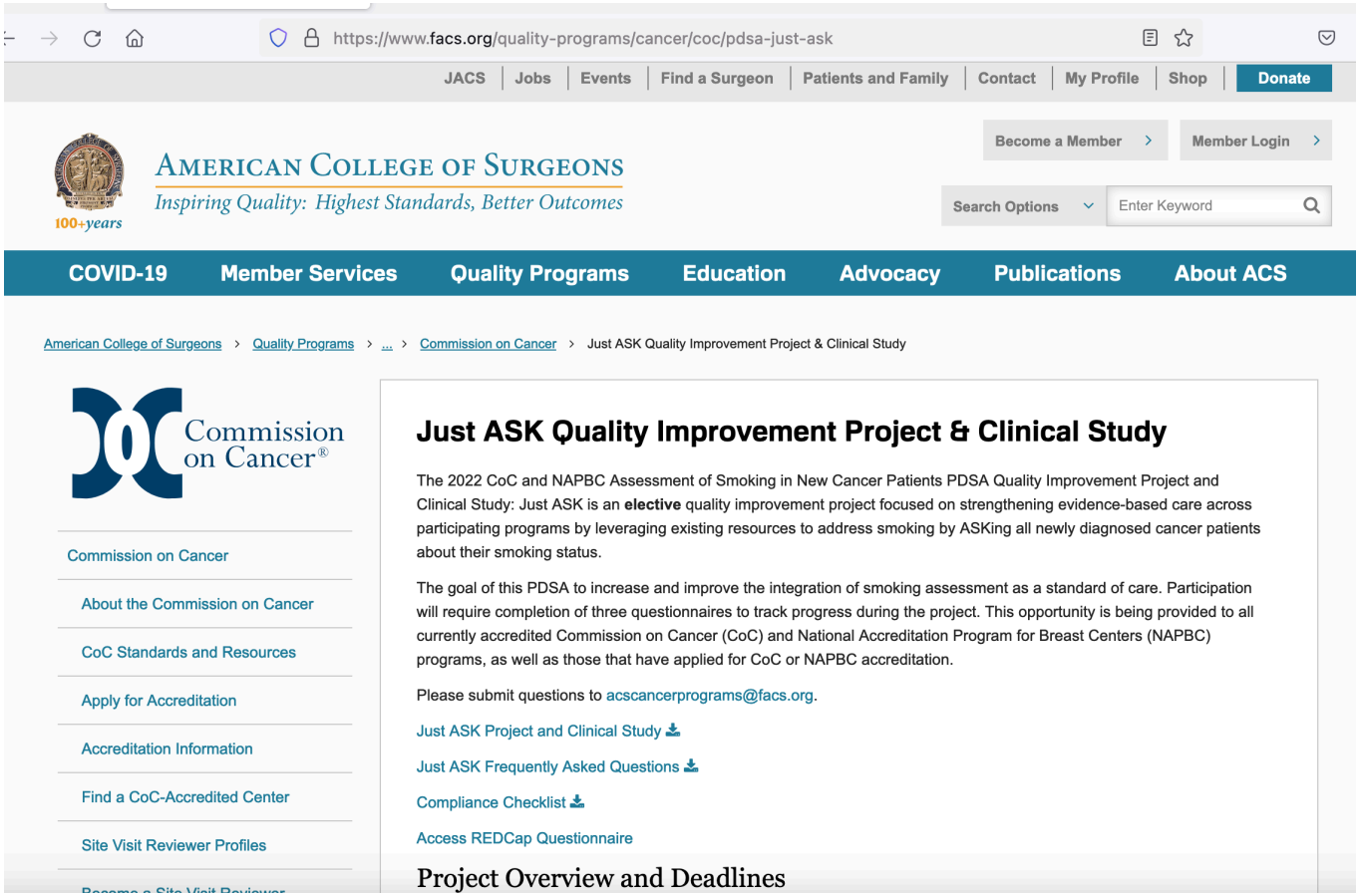
Access increased from 26% in 2016/17 to 95% in 2022

JURISDICTION[a]	BEHAVIOURAL COUNSELLING	PHARMACO-THERAPY	PERSON-CENTERED	CULTURALLY COMPETENT	PARTNERSHIP	INDICATOR MEASUREMENT AND REPORTING	PROVINCIAL/ TERRITORIAL LEVEL
Yukon	G	G	P	S	G	S	GOLD
Northwest Territories	B	G	P	G	P	P	SILVER
Nunavut	B	G	B	S	B	P	SILVER
British Columbia	G	G	G	S	G	G	GOLD
Alberta	B	S	S	B	S	B	SILVER
Saskatchewan	S	G	B	B	S	P	SILVER
Manitoba	S	G	G	B	G	S	GOLD
Ontario	S	S	G	S	S	G	GOLD
New Brunswick[b]	G	G	G	B	G	G	GOLD
Nova Scotia	S	S	B	P	S	P	SILVER
Prince Edward Island	G	G	S	B	G	S	GOLD
Newfoundland and Labrador	S	G	G	S	S	G	GOLD
Average level for each category	SILVER	GOLD	SILVER	BRONZE	SILVER	SILVER	CANADA: SILVER

ACOS Commission on Cancer

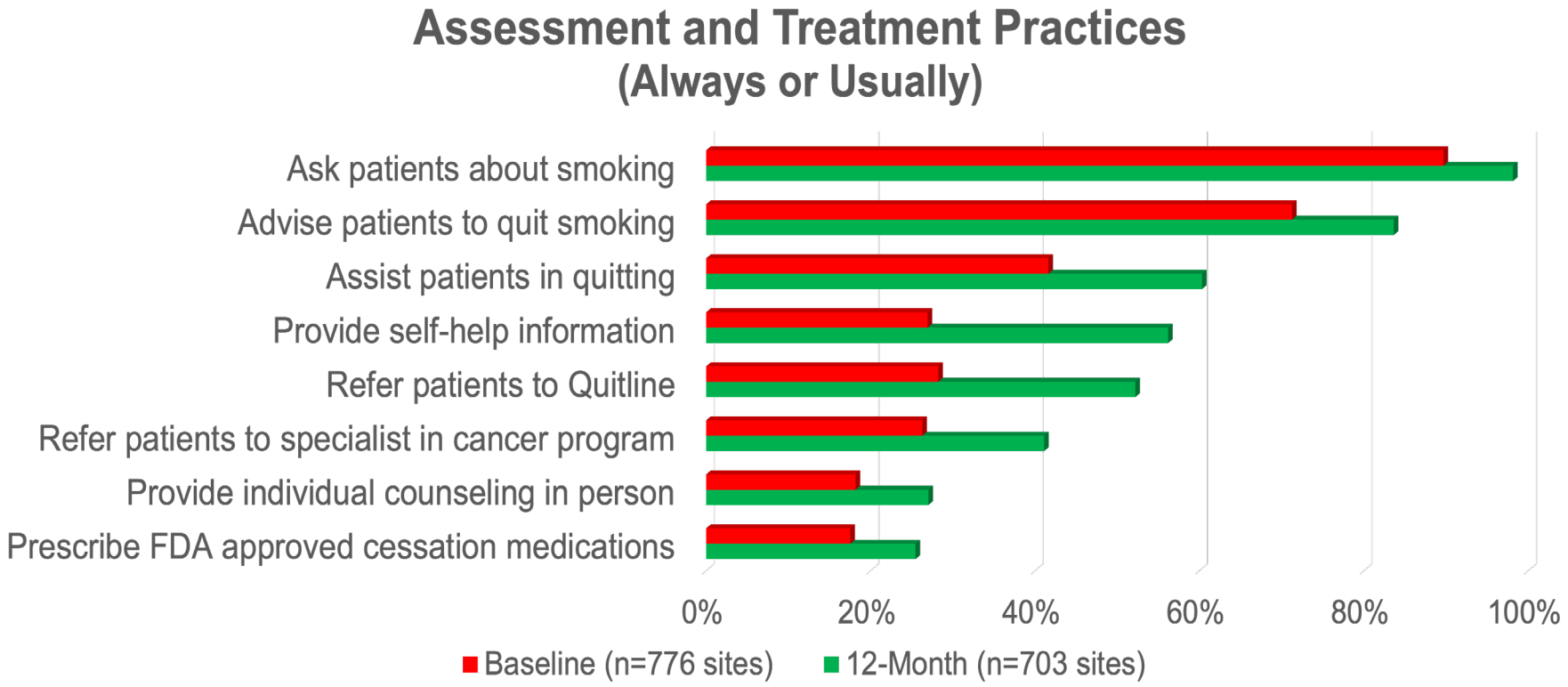
Access to ~1,500 cancer centers, ~70% of cancer patients

Just ASK (776 programs) and **Beyond ASK** (>300 programs)



https://www.facs.org/quality-programs/cancer/coc/pdsa-just-ask

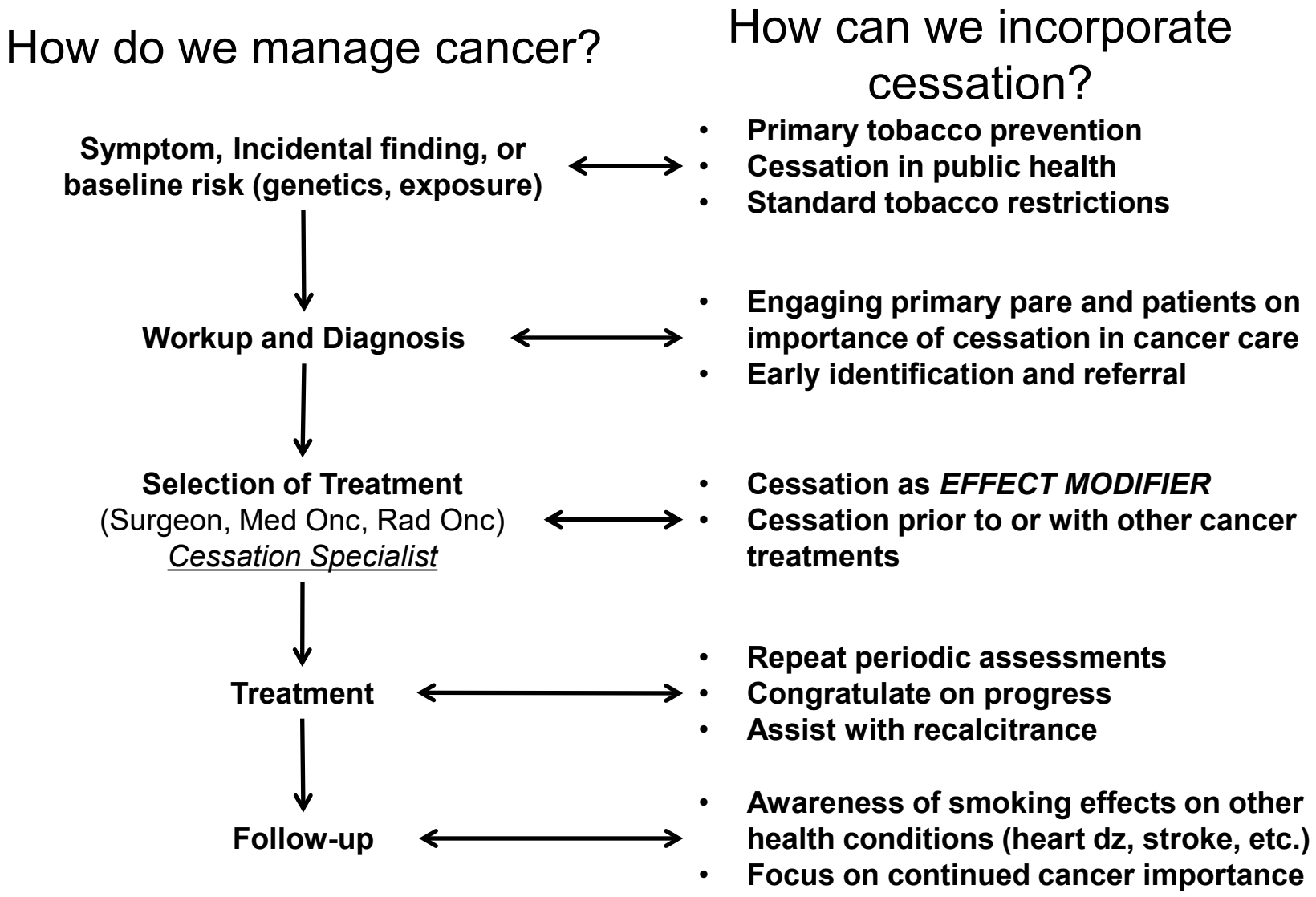
CoC: Just ASK Results



Can an accrediting organization move the needle?

Burris et al., J Clin Oncol 2024

Adding Cessation Across Cancer Care



A Final Question and Suggestion…

Is it malpractice to omit smoking from cancer care, and it is scientifically ethical to omit smoking from research?

Addressing tobacco in cancer care may be the EASIEST, CHEAPEST, and LOWEST TOXICITY approach to significantly improve patient outcomes