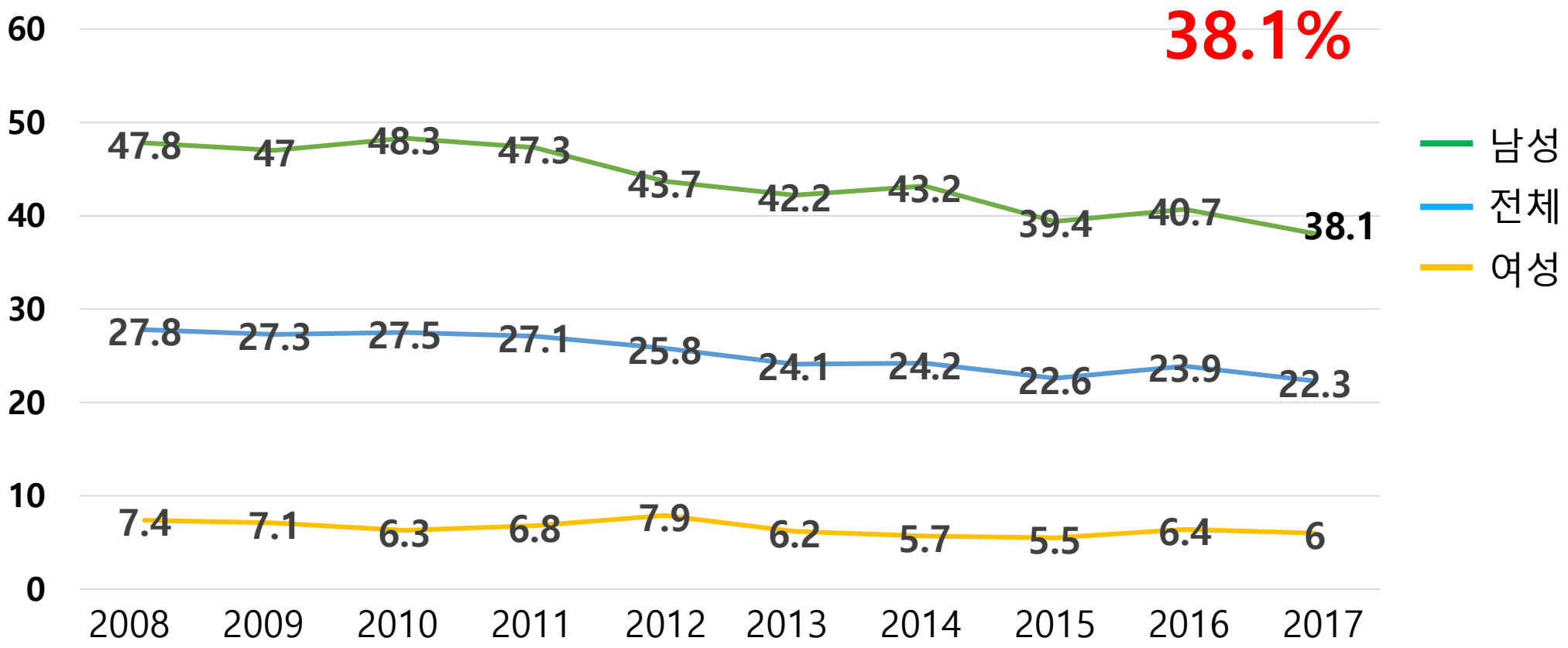
Guidance and update on stopping smoking

이화여자 의과대학
천은미

국내 연도별,성별 현재 흡연율



Effect of smoking reduction on lung cancer risk

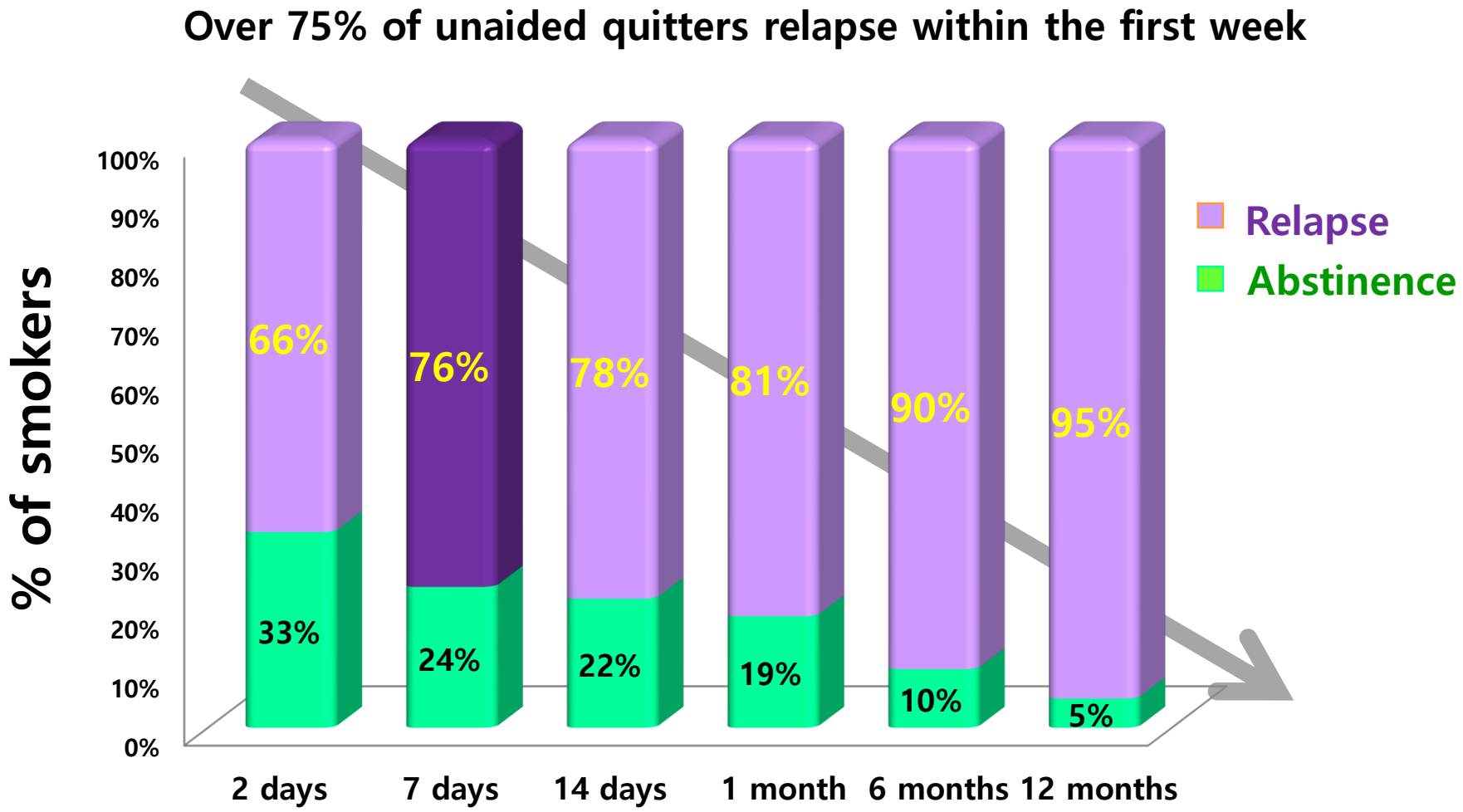
(n=19734, lung cancer: 864 follow up: 1964-2004)

	Heavy smokers (576)	Reducers (52)	Light smokers (104)	Quitters (baseline Smokers) (52)	Ex smokers (continued) (52)	Never smokers (28)
Crude HR (95% CI)	1.00	0.68 (0.50-0.91)	0.40 (0.32-0.50)	0.36 (0.27-0.49)	0.17 (0.13-0.23)	0.09 (0.06-0.13)
Adjusted HR (95% CI)	1.00	0.73 (0.54-0.98)	0.44 (0.35-0.56)	0.50 (0.36-0.69)	0.17 (0.13-0.23)	0.09 (0.06-0.13)

Godfredsen NS etal. JAMA 2005 Sep 28;294(12):1505

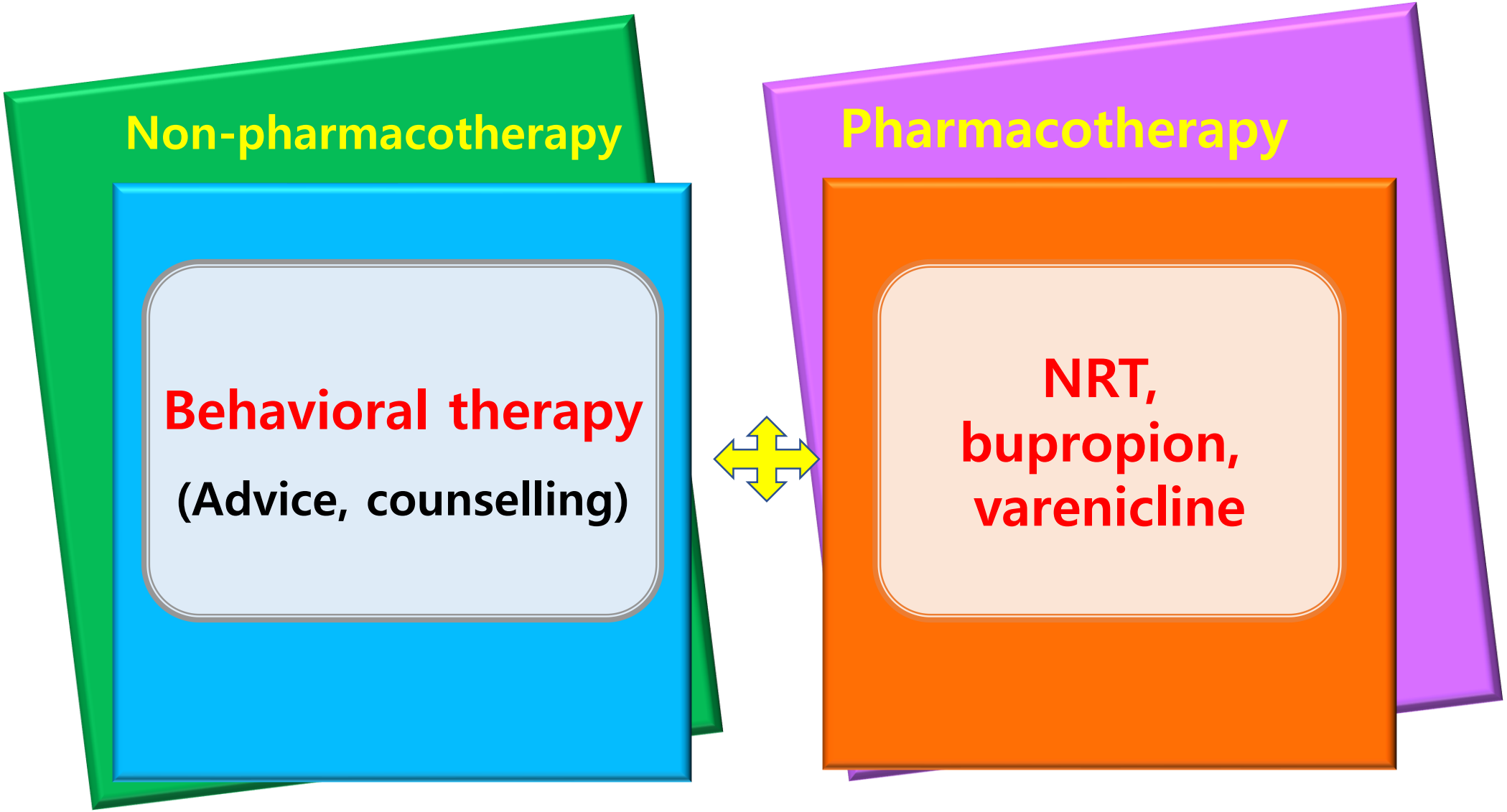
Smoking is relapsing disease

Relapsing pattern in smokers who quit without aid



Hughes JR et al. Cochrane Data Syst Rev 2014

Standard strategies for smoking cessation



Continuous abstinence rates by time of contacts

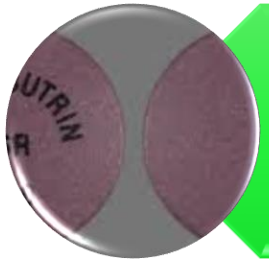
Amount of contact time	No of Arms	OR (95%CI)	Abstinence rate(95% CI)
No minutes	16	1.1	11.0
1-3 minutes	12	1.4(1.1-1.8)	14.4(11.3-17.5)
4-30 minutes	20	1.9(1.5-2.3)	18.8(15.6-22.0)
31-90 minutes	16	3.0(2.3-3.8)	26.5(21.5-31.4)
91-300 minutes	16	3.2(2.3-4.6)	28.4(21.3-35.5)
> 300 minutes	15	2.8(2.0-3.9)	25.5(19.2-31.7)

Recommendation: Intensive interventions are more effective than less intensive interventions and should be used whenever possible.

www.surgeongeneral.gov/tobacco

First line pharmacotherapy
recommended by FDA for smoking cessation

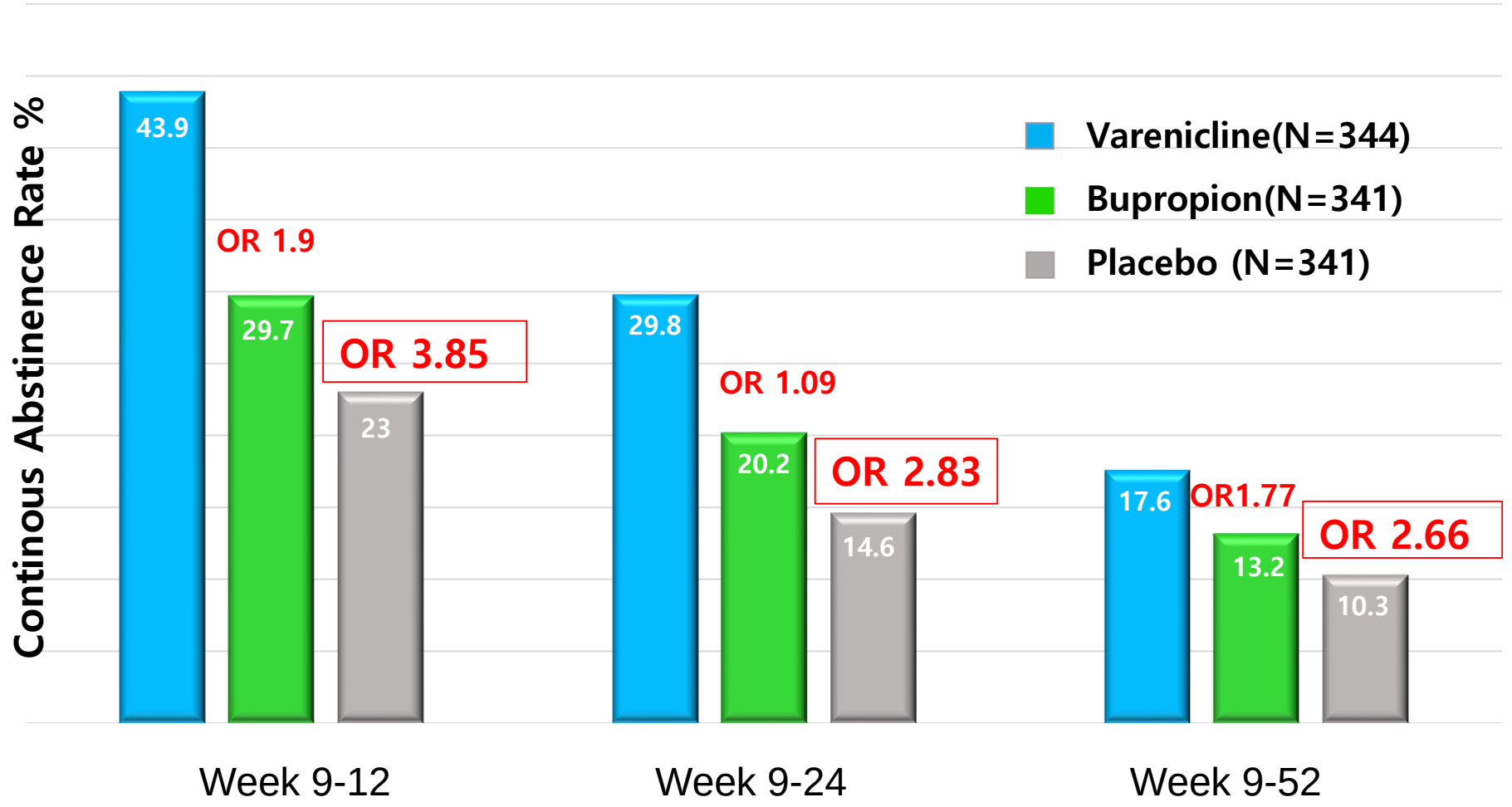
Nicotine Replacement Therapy



Bupropion SR

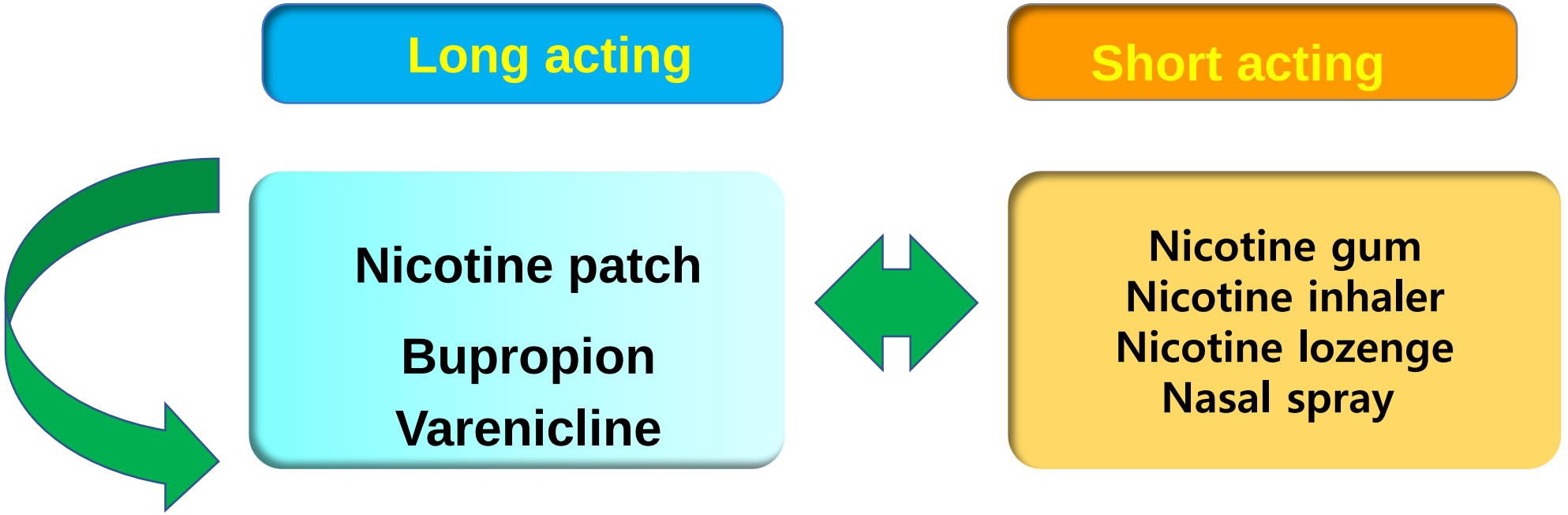
Varenicline

Efficacy of Varenicline, vs Placebo or Bupropion for Smoking Cessation - RCT



Jorenby DE et al. JAMA 2006

Combination Therapy of first line pharmacotherapy

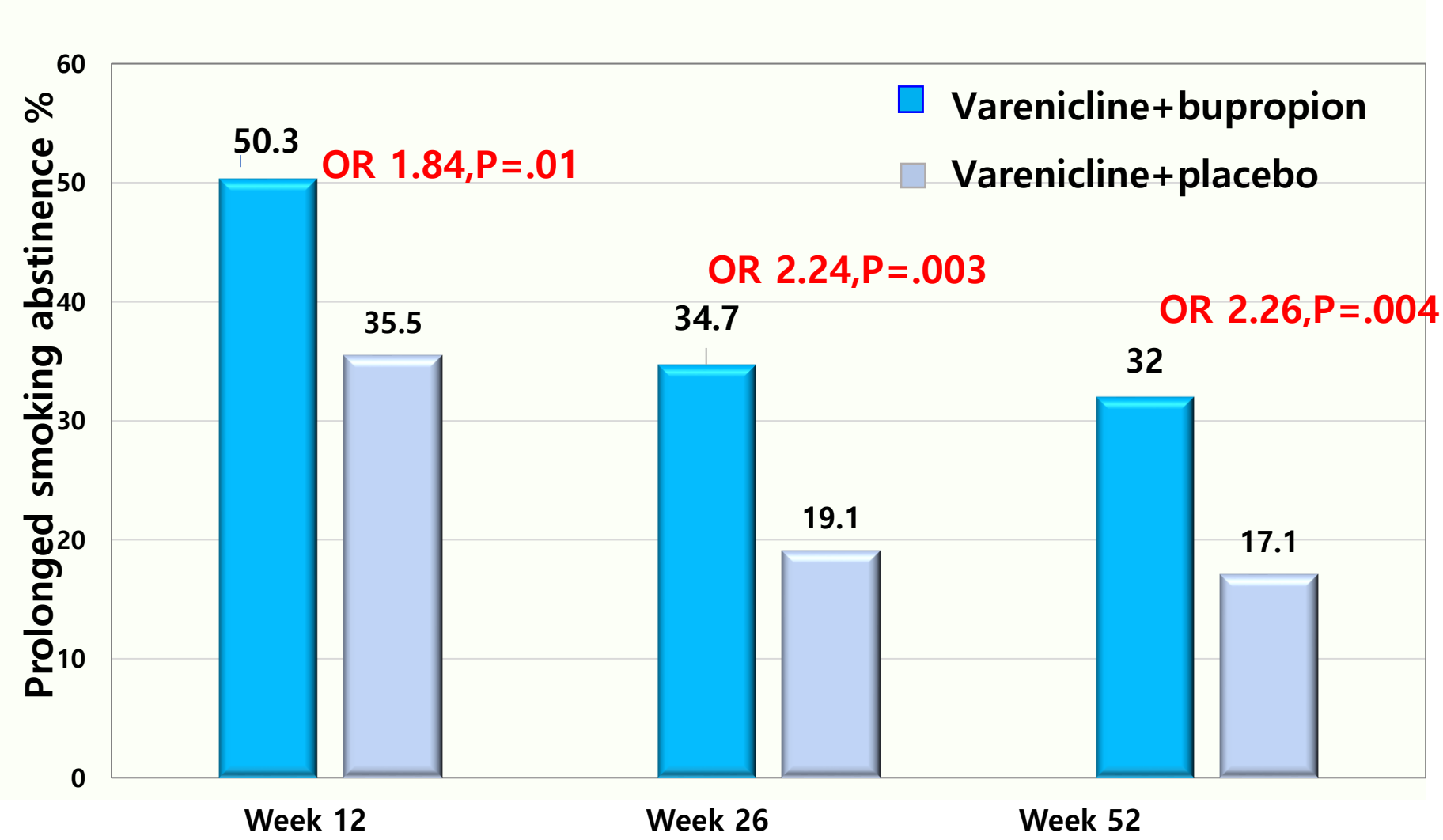


Combination therapy of Varenicline plus Nicotine patch compared with placebo

					No.(%)
		Varenicline +Nicotine patch	Varenicline + Placebo	OR(95% CI)	P-value
Since TQD	Time period	(n=216)	(n=219)		
Continuous Abstinence Rate					
8 wk	weeks 5-8	96(44.4)	76(34.7)	**1.5**(1.02-2.22)	.04
12 wk	weeks 9-12	99(45.8)	70(32.0)	**1.8**(1.22-2.66)	.003
16 wk	weeks 9-16	84(38.9)	56(25.6)	**1.85**(1.23-2.79)	.003
24 wk	weeks 9-24	71(32.9)	42(19.2)	**2.06**(1.33-3.21)	.001

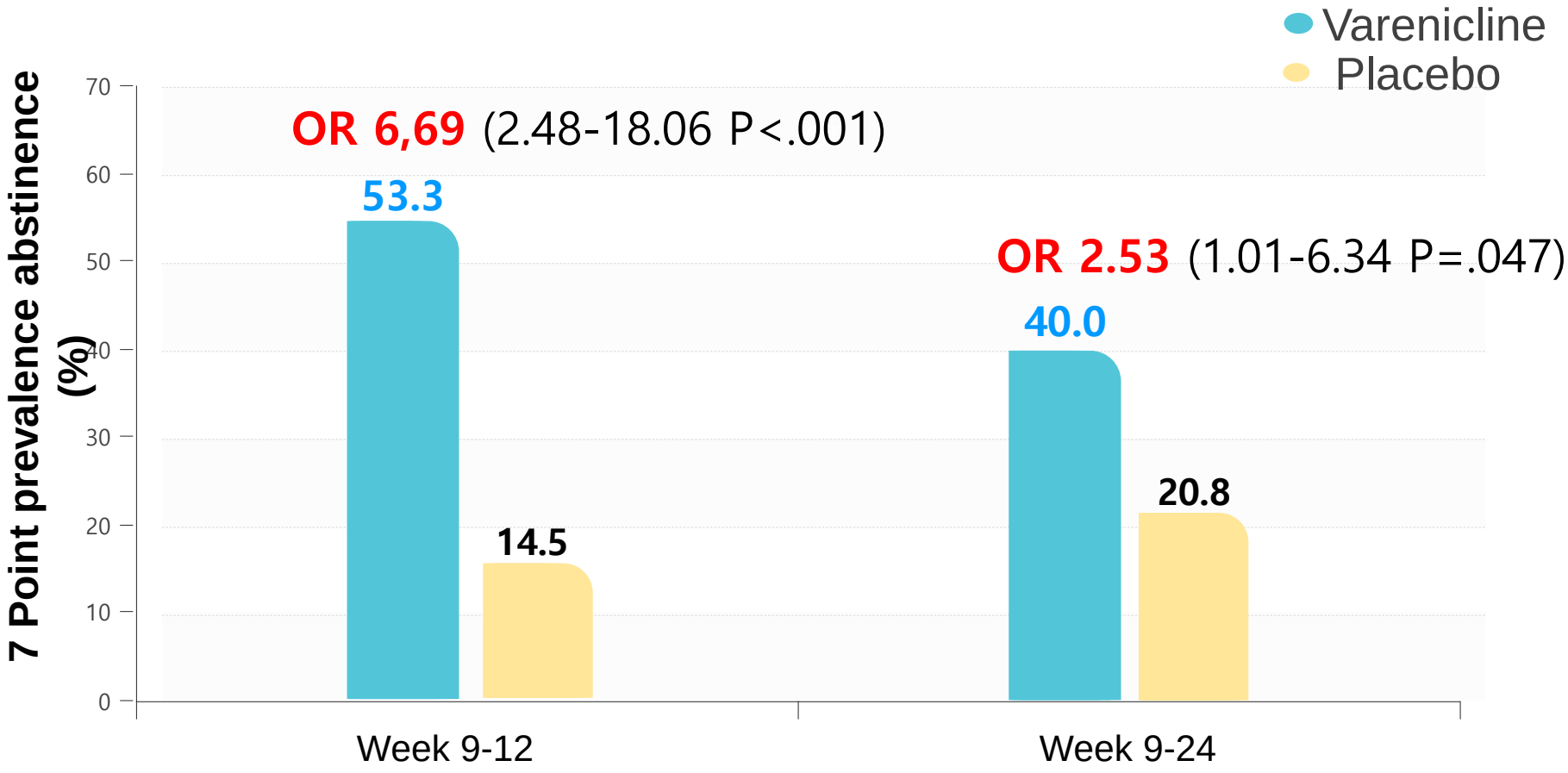
Koegelenberg CF et al. JAMA 2014

Smoking Abstinence Outcomes According to Baseline Smoking Rate by combination therapy



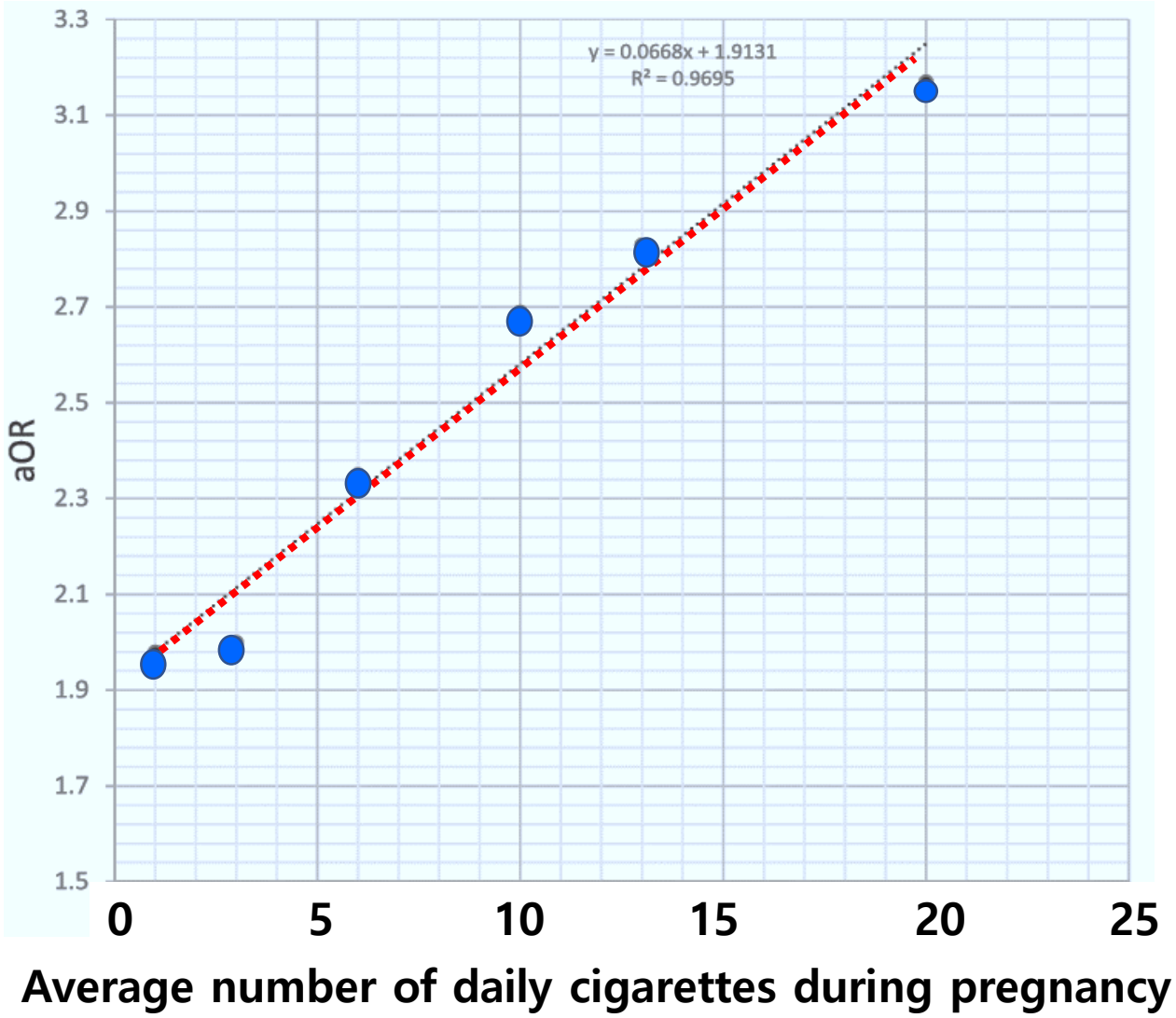
Ebbert JO et al. JAMA. 2014

Varenicline for Smoking Cessation in Light Smokers



Ebbert JO, et al. Nicotine Tob Res. 2016 Oct;18(10):2031-5.

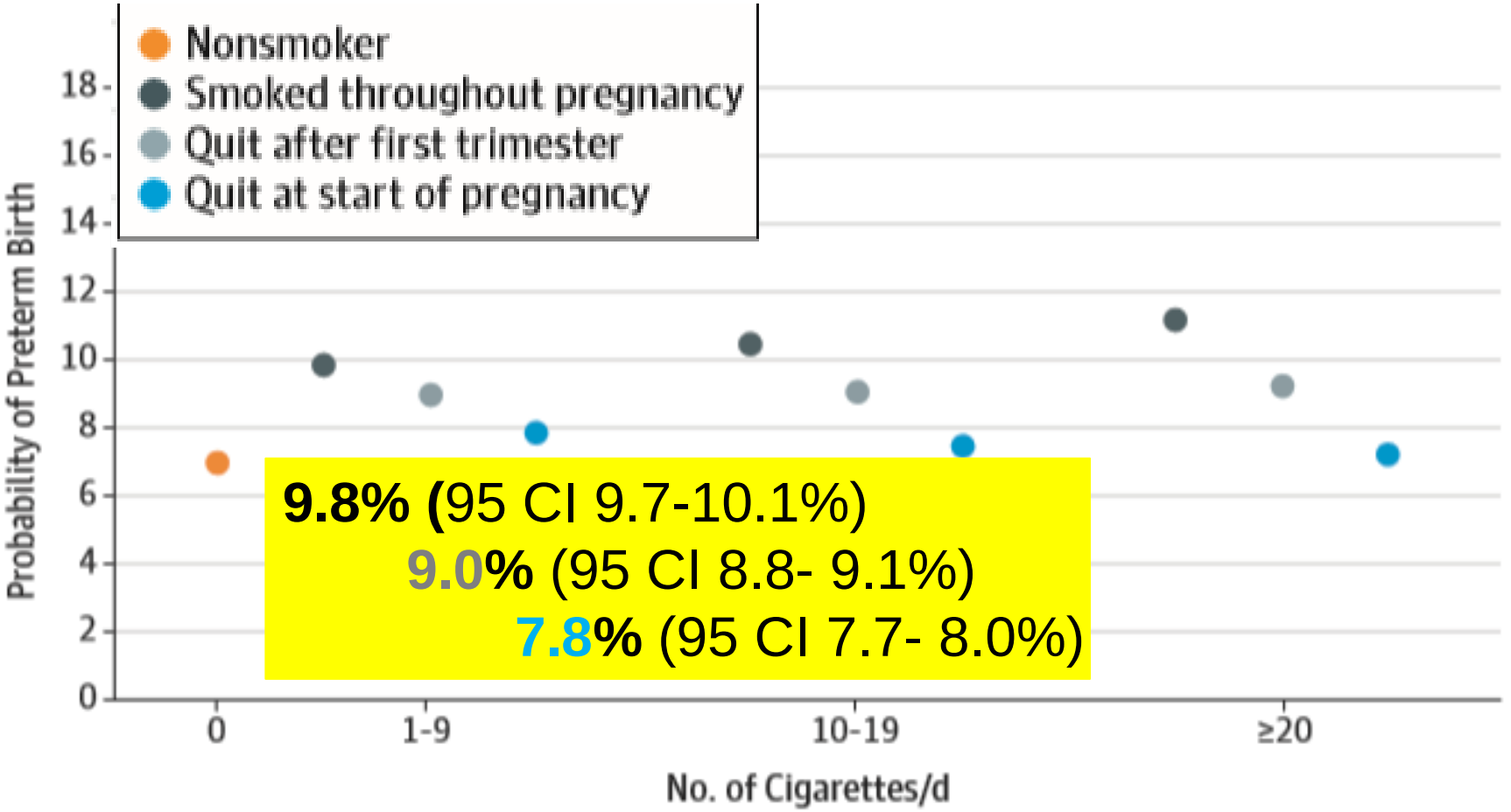
Maternal Smoking Before and During Pregnancy and the Risk of Sudden Unexpected Infant Death



Pediatrics 2019 Apr;143(4). Pil:e20183325

Estimated Probability of Preterm Birth (<37Weeks'Gestation) by Cigarette Smoking Frequency

n=25 233 503 expectant mothers, 2011-2017 US



Soneji S et al. JAMA Netw Open 2019 Apr5;2(4):e192514

EAGLES: Method

- 24주간 진행된 이중 맹검, 다기관, 위약 및 니코틴 대체요법 대조 임상 연구
- 16개국 환자들을 무작위로 배정 12주 동안 치료, 그 후 12주간은 치료 없이 추적
- 18-75세의 성인 8,144명을 대상

Safety

정신질환이 있거나 없는 흡연자에서

니코틴패치, 챔픽스와 부프로피온의

신경정신과적 안전성 프로파일

Efficacy

정신질환이 있거나 없는 흡연자에서

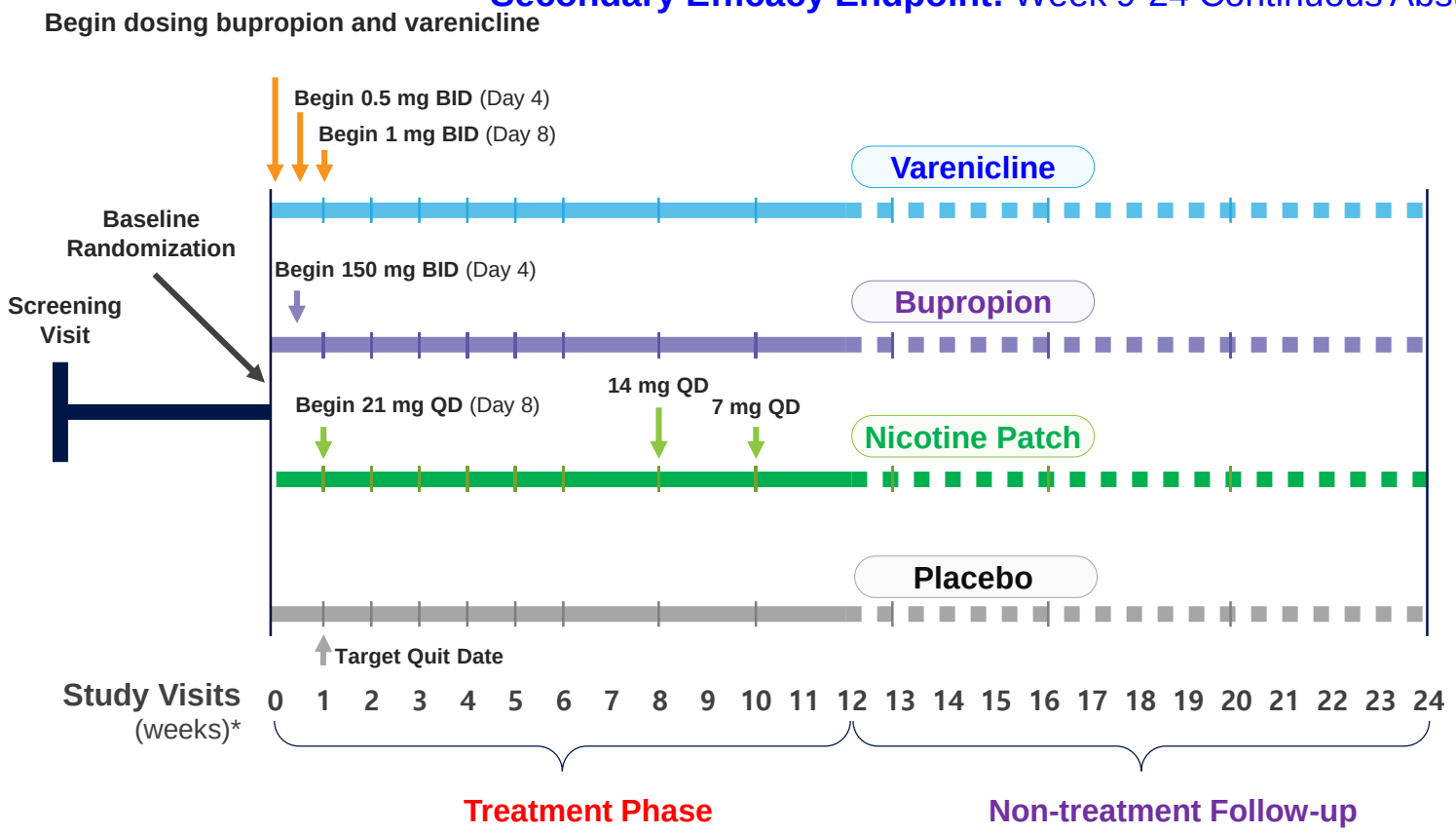
니코틴패치, 챔픽스와 부프로피온의

금연지속율(CAR)을 비교

EAGLES protocol

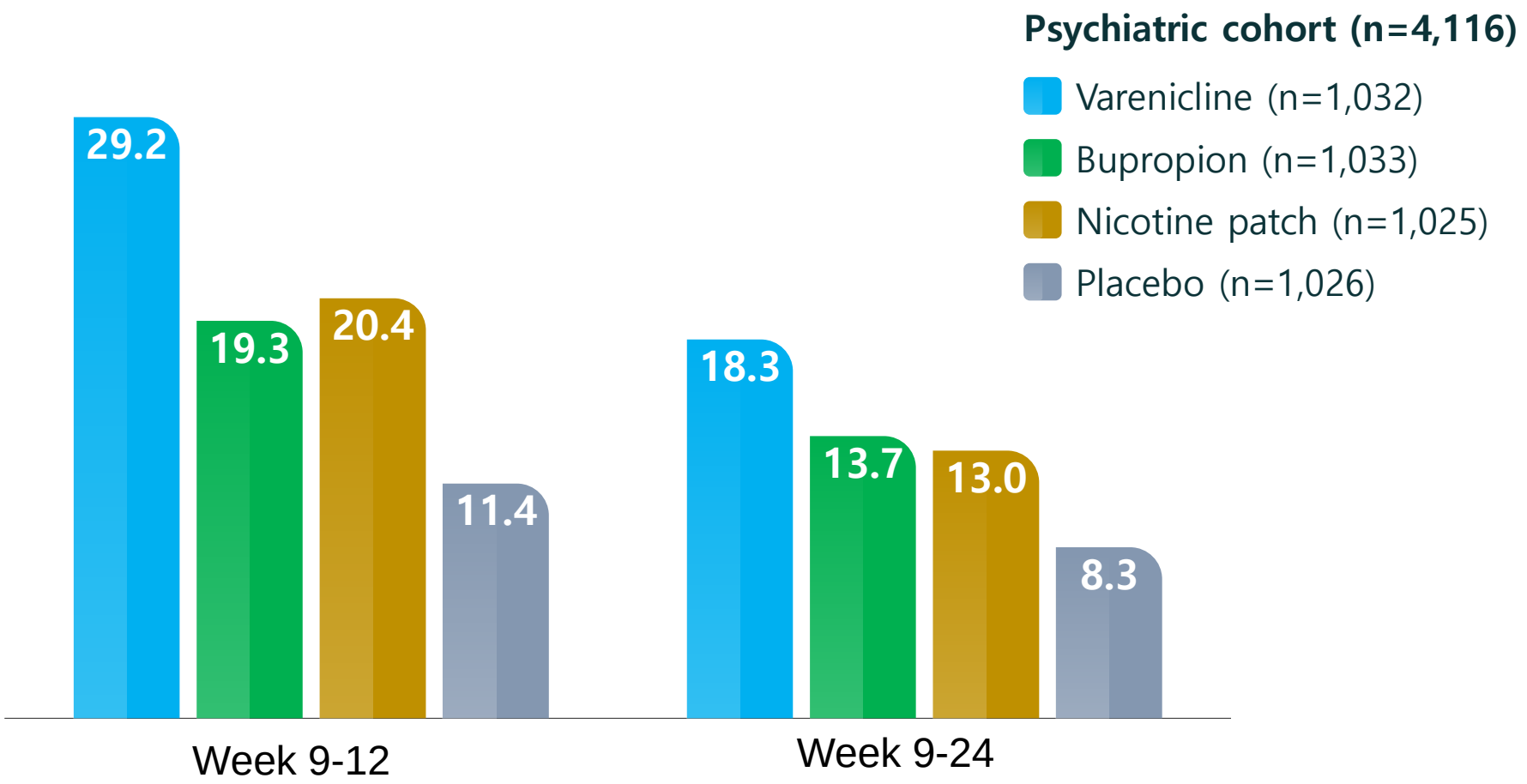
Primary Efficacy Endpoint: Week 9-12 Continuous Abstinence Rate

Secondary Efficacy Endpoint: Week 9-24 Continuous Abstinence Rate



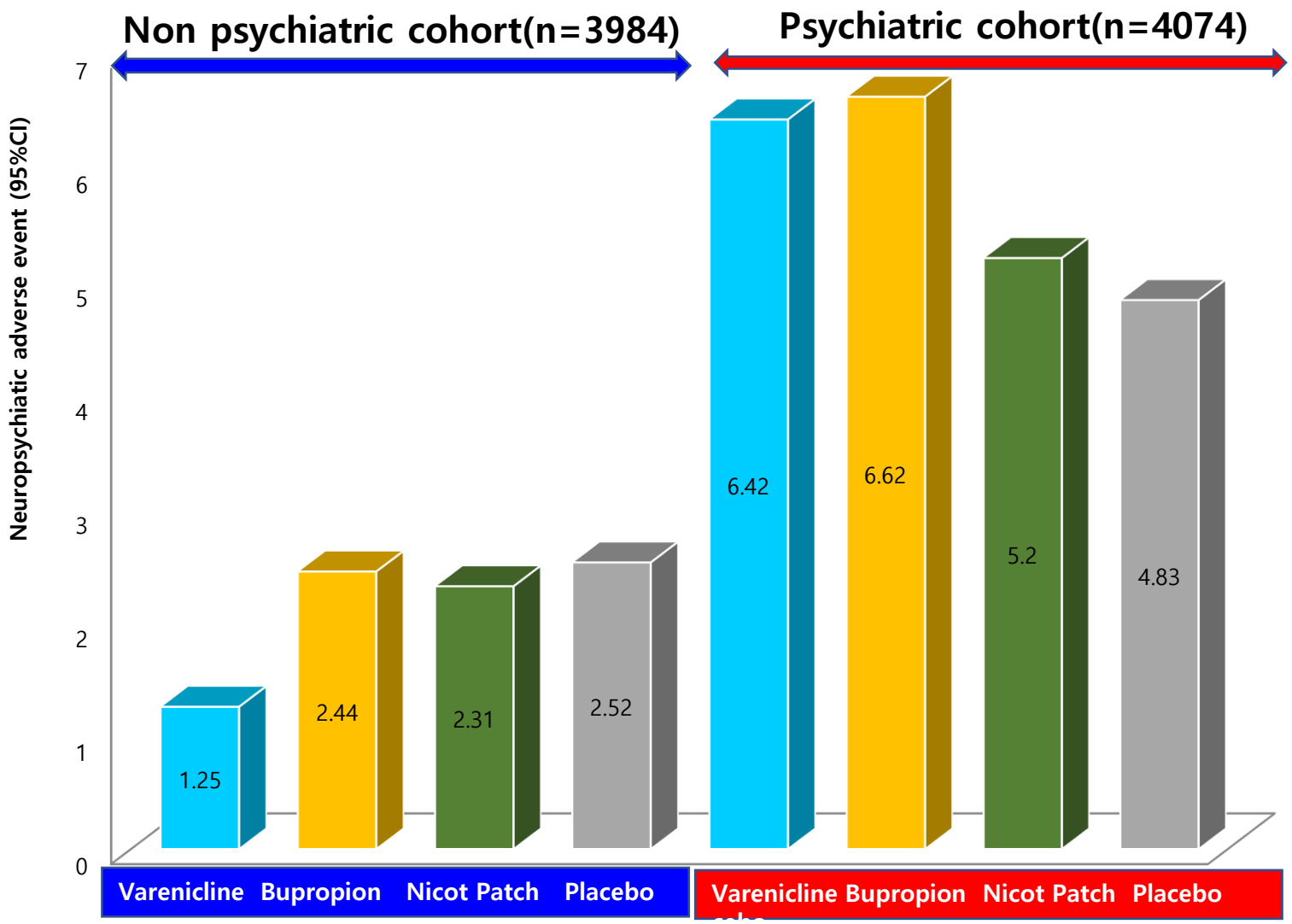
Anthenelli RM et al. Lancet 2016

Superior Efficacy in psychiatric cohort



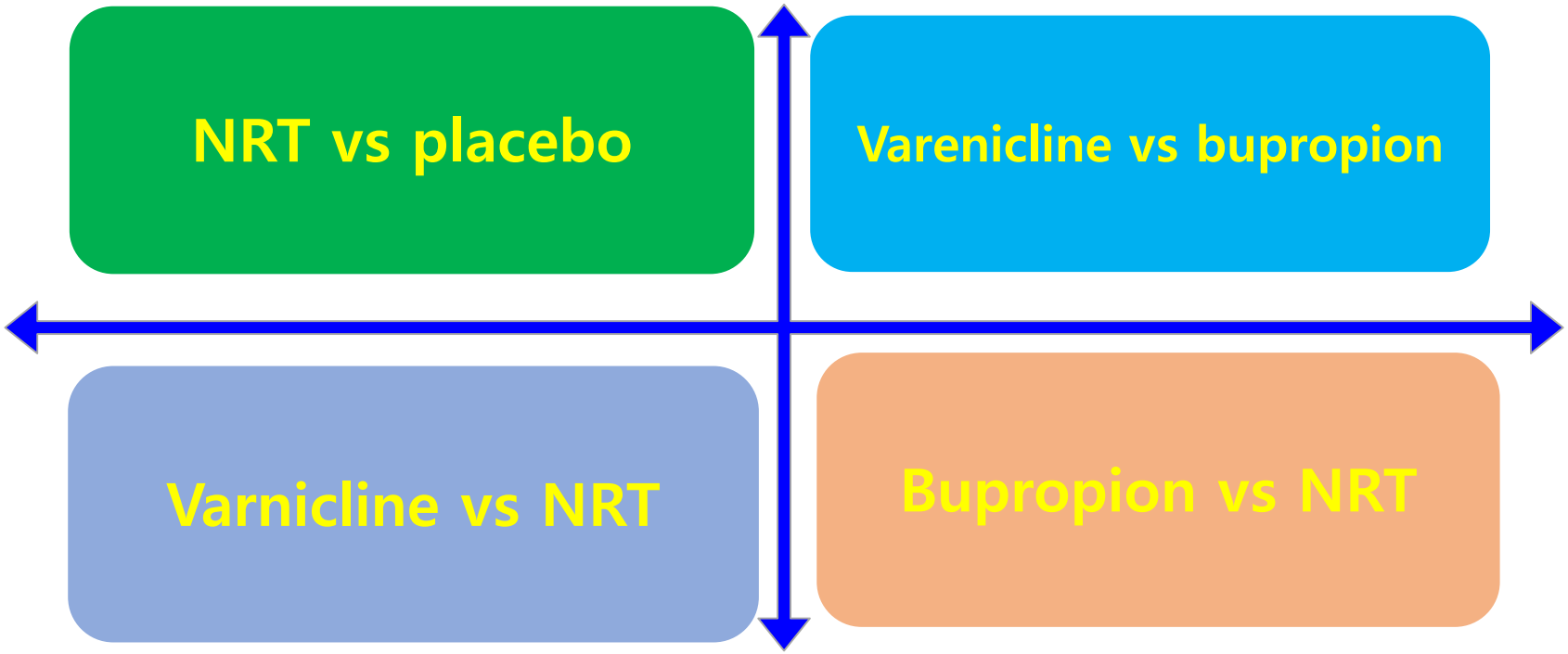
. Anthenelli RM et al Lancet 2016

EAGLES
Neuropsychiatric composite safety endpoint



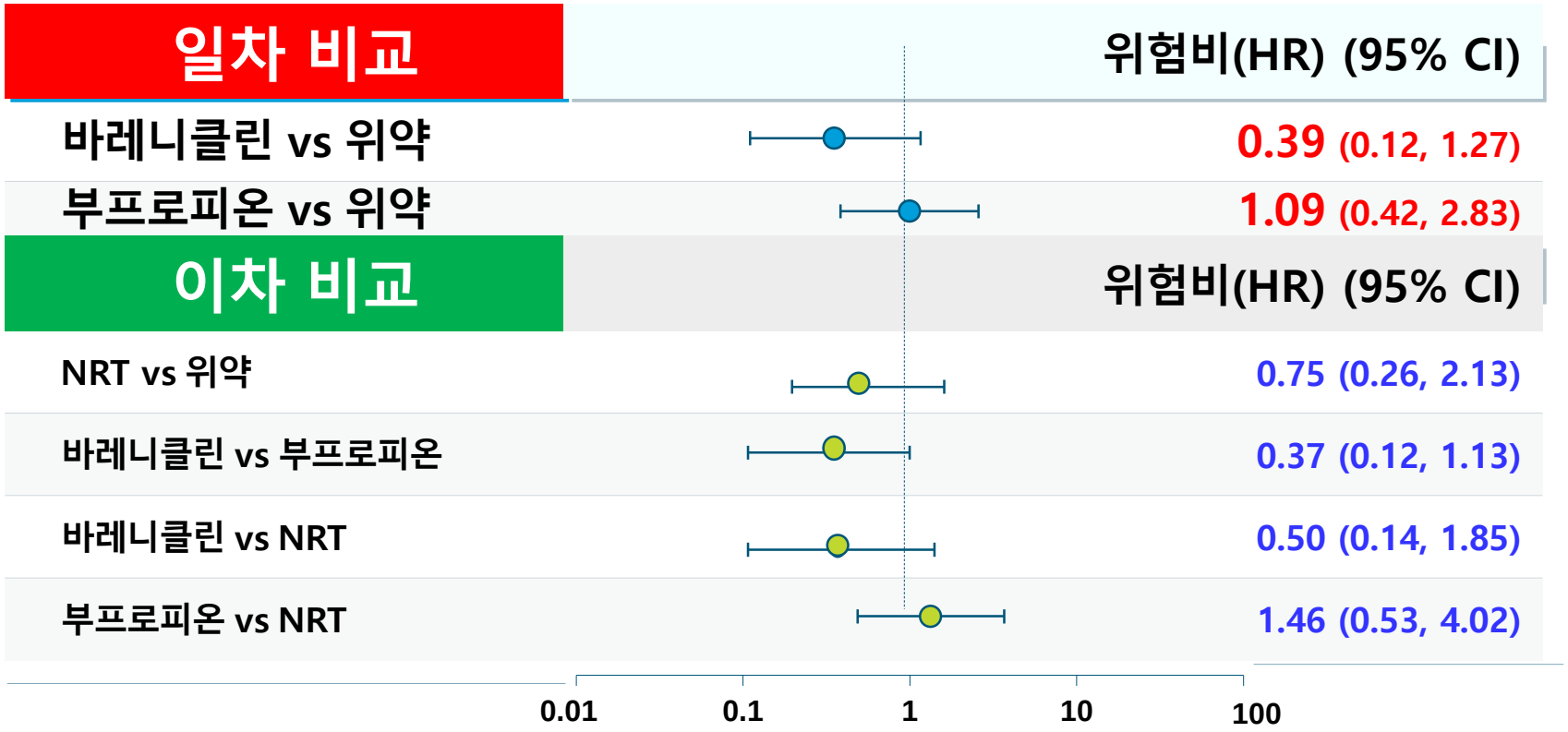
Anthenelli RM et al. Lancet 2016

Cardiovascular safety of varenicline, bupropion, nicotine patch in smokers: RCT



Hazard Ratios for Time to Occurrence of MACE(major adverse cardiovascular events)

There were no significant difference(p>.05) in time to MACE or MACE+ in either NPC, or PC comparing active treatment with placebo.



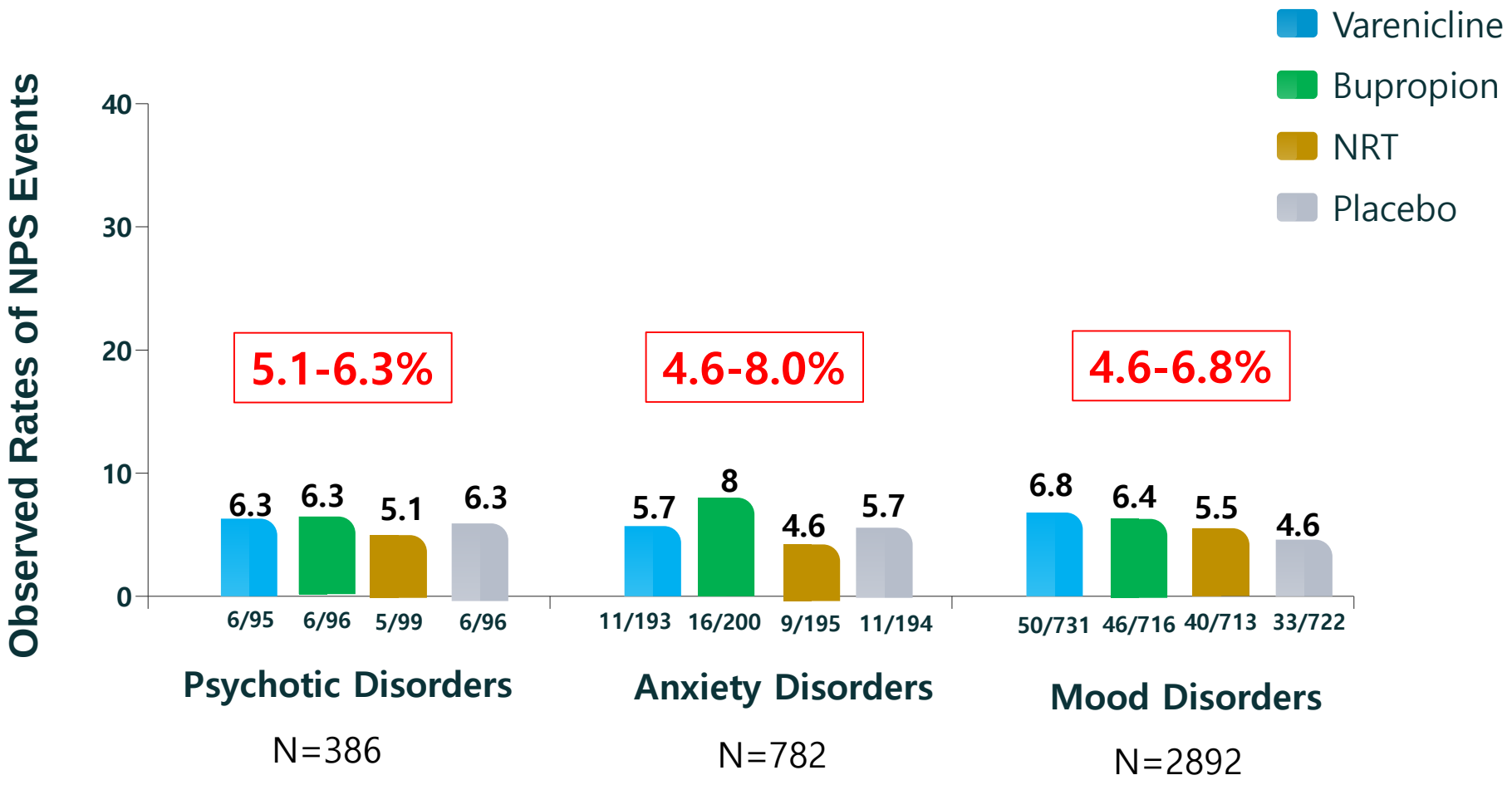
Benowitz NL, et al. JAMA Intern Med. 2018;178(5):622-631.

EAGLES Omnibus:
EAGLES Post-hoc Secondary Analysis

Neuropsychiatric Safety and Efficacy of Varenicline, Bupropion, and Nicotine Patch in Smokers with Psychotic, Anxiety, and Mood Disorders in the EAGLES Trial

Evins EE, et al. Journal of Clinical Psychopharmacology 2019

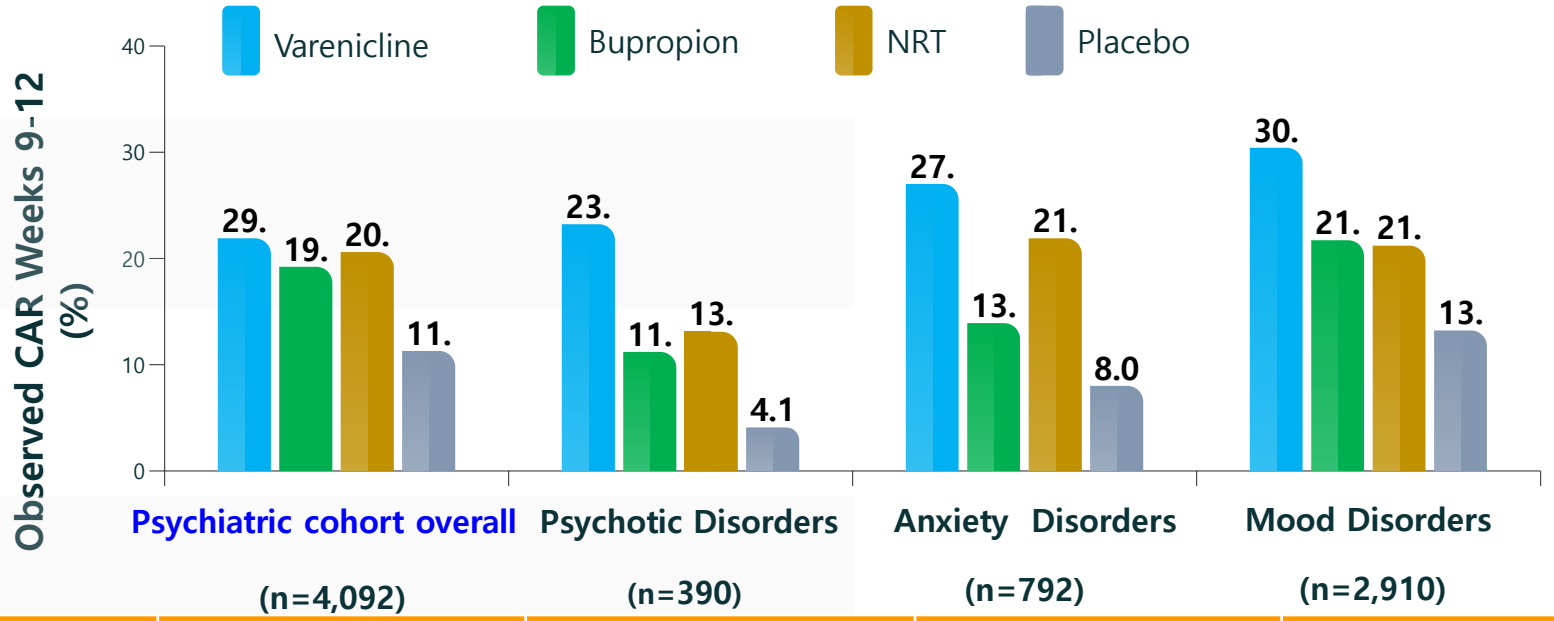
Primary NPS safety endpoint by primary baseline psychiatric diagnosis and treatment groups



Evins EE, et al. Journal of Clinical Psychopharmacology 2019

Comparison of Continuous abstinence rates(CAR)

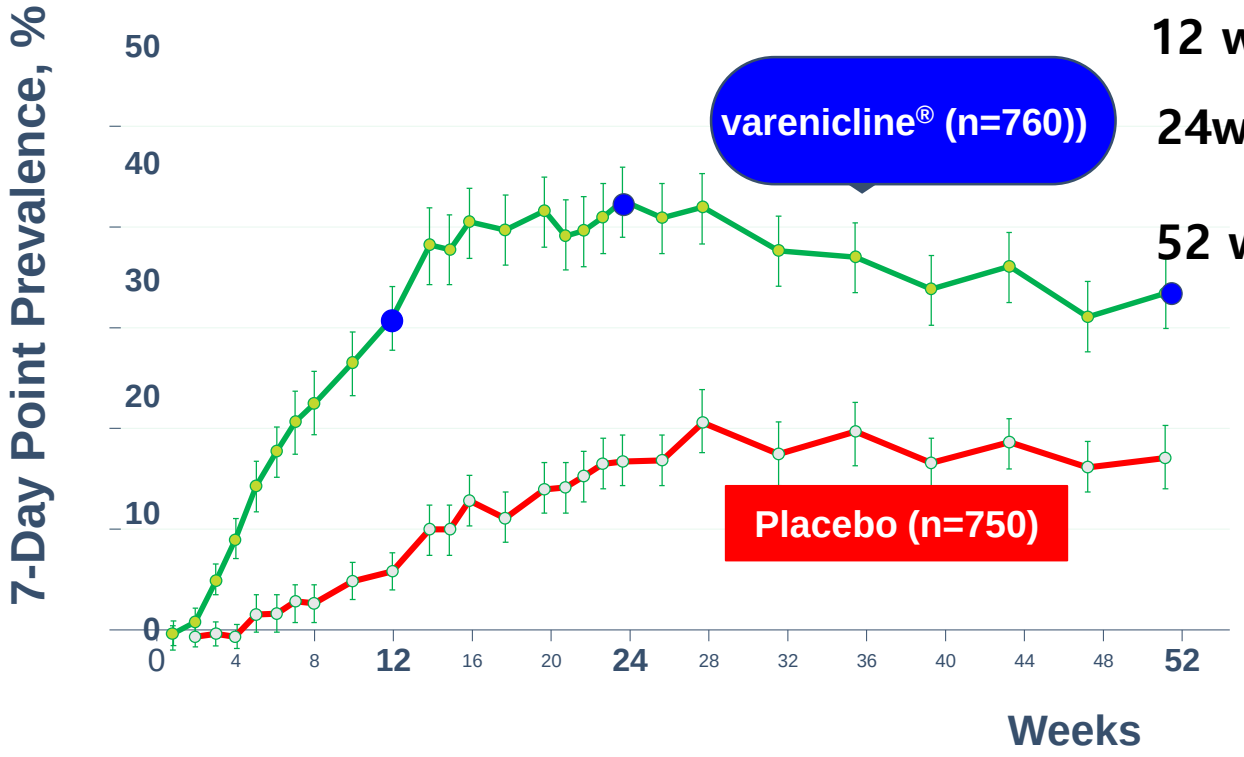
Weeks 9-12



Treatment comparison	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)
Varenicline vs Placebo	**4.57**(2.59 to 8.09)	**6.93**(1.61to29.84)	**4.55**(2.05to10.11)	**3.30**(2.13to4.32)
Bupropion vs Placebo	2.22(1.21to4.06)	2.99(0.63to14.4)	1.91(0.81to4.51)	1.91(1.32to2.76)
Nicot patch vs Placebo	2.76(1.53to4.97)	3.40(0.74to15.61)	3.43(1.52to7.74)	1.80(1.24to2.61)

Gradual reduction of smoking cessation

Higher Smoking Cessation rate



12 weeks((RR), 4.7 [95% CI, 3.5-6.2])

24weeks((RR), 2.5 [95% CI, 2.1-3.0])

52 weeks((RR), 1.9 [95%CI, 1.6-2.2])

Ebbert JO, et al. JAMA. 2015 Feb 17;313(7):687-694

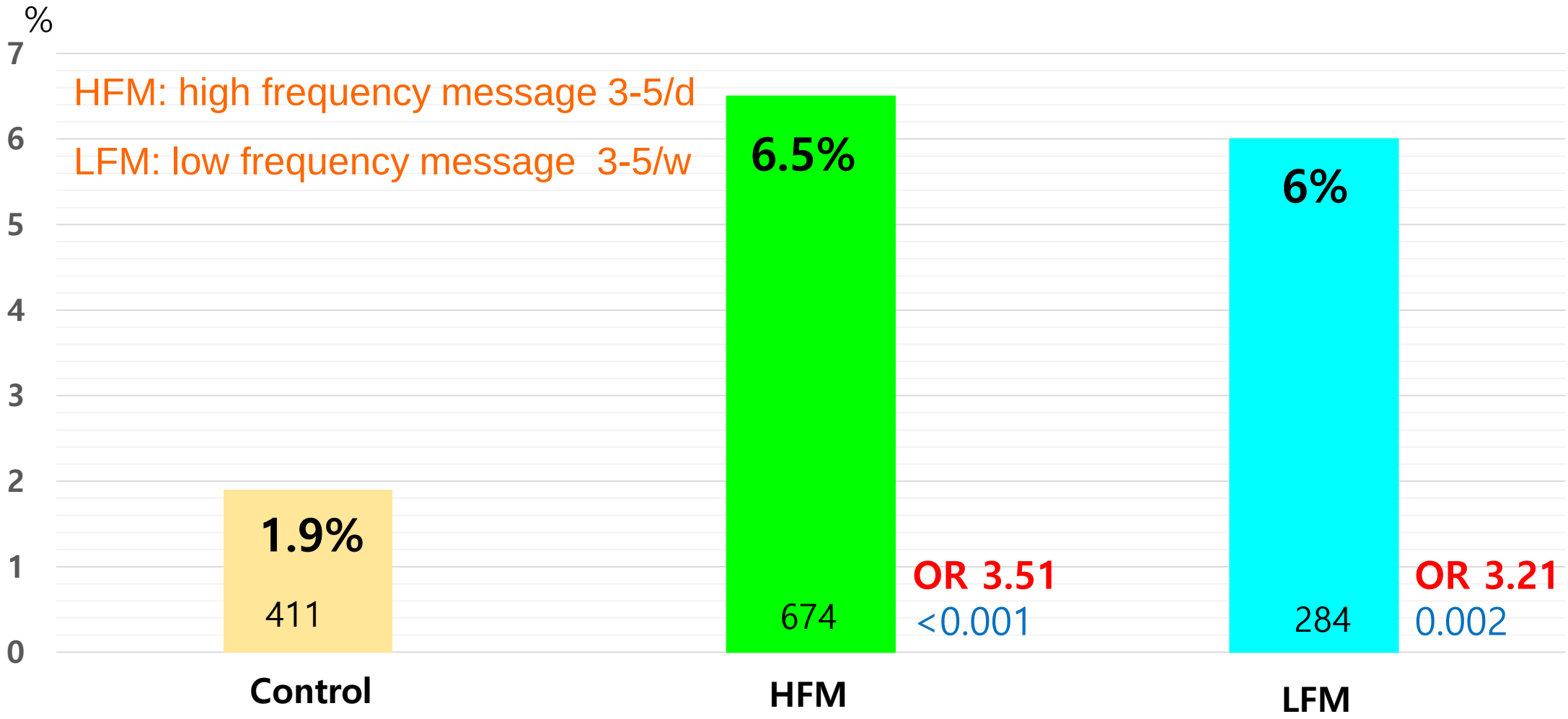
Changes in smoking prevalence and cessation support, and factors associated with successful smoking cessation in Swedish patients with asthma and COPD(2005-2012)

Factors associated with successful smoking cessation

Variables	Men with asthma AOR(95%CI)	P -value	Women with asthma AOR(95%CI)	P-value
High cardiovascular risk factor level	27.9(1.73-450)	0.02	2.47(0.48-12.8)	0.28
High level of education	0.33(0.02-4.56)	0.41	4.76(1.22-18.7)	0.03

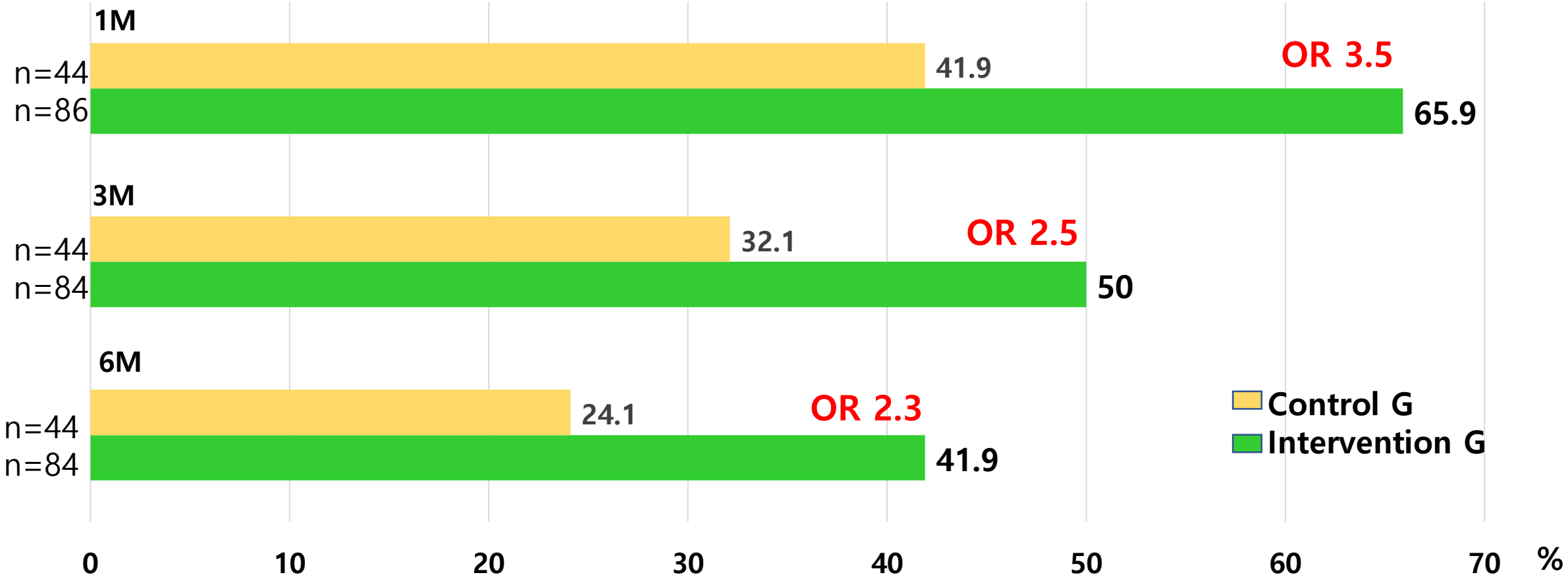
Sterberg M et al.Eur Clin Respir2018; 5(1): 1421389.1

Effectiveness of a text-messaging-based smoking cessation intervention



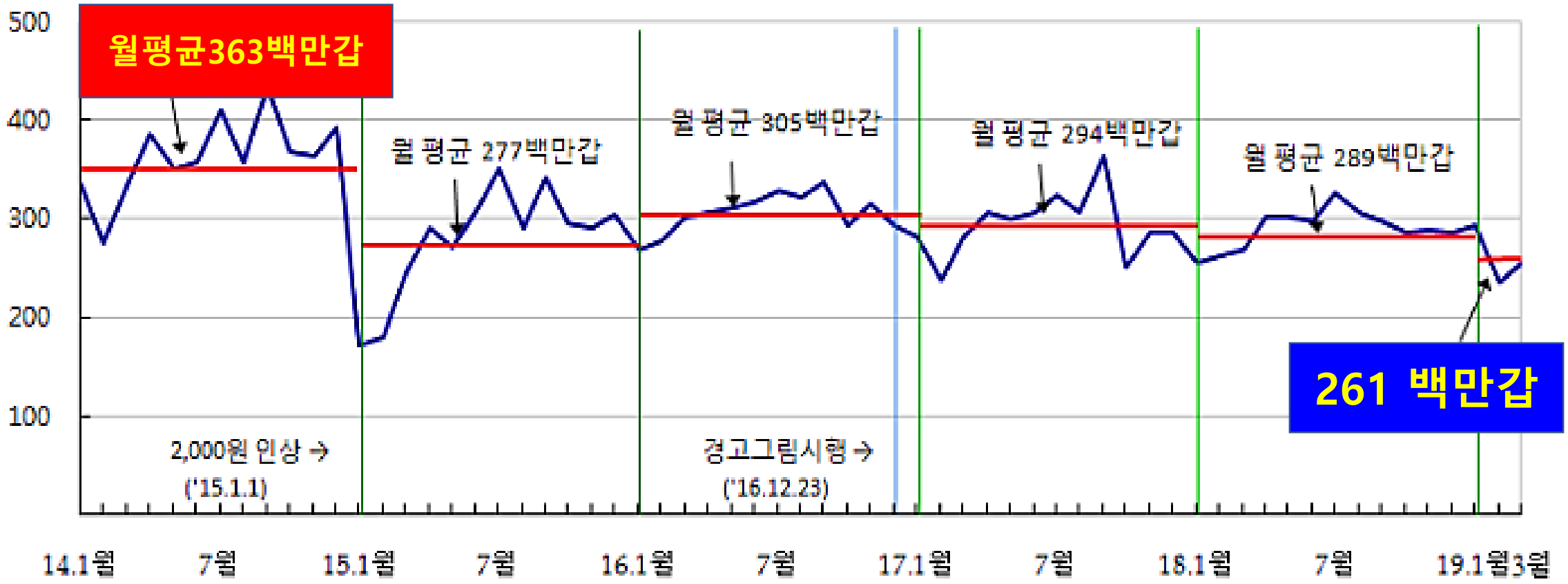
PLoS Med 2018 Dec 18;15(12):e1002713

WhatsApp embedded in routine service delivery for smoking cessation: effects on abstinence rates in a RCT



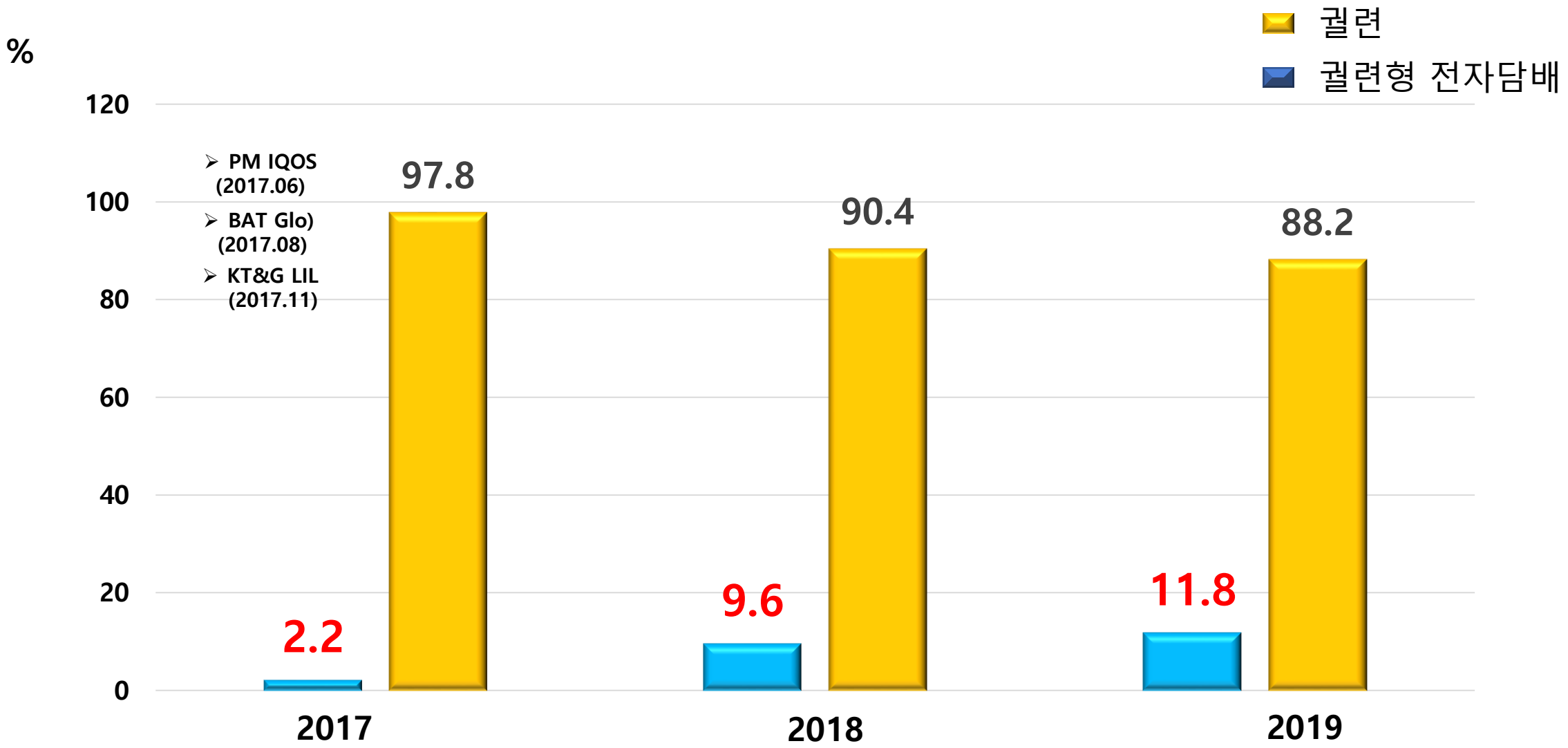
Durma S et al. BMC Public Health 2019 8;19(1):387

2104-2019 국내 담배 판매량 변화 추이



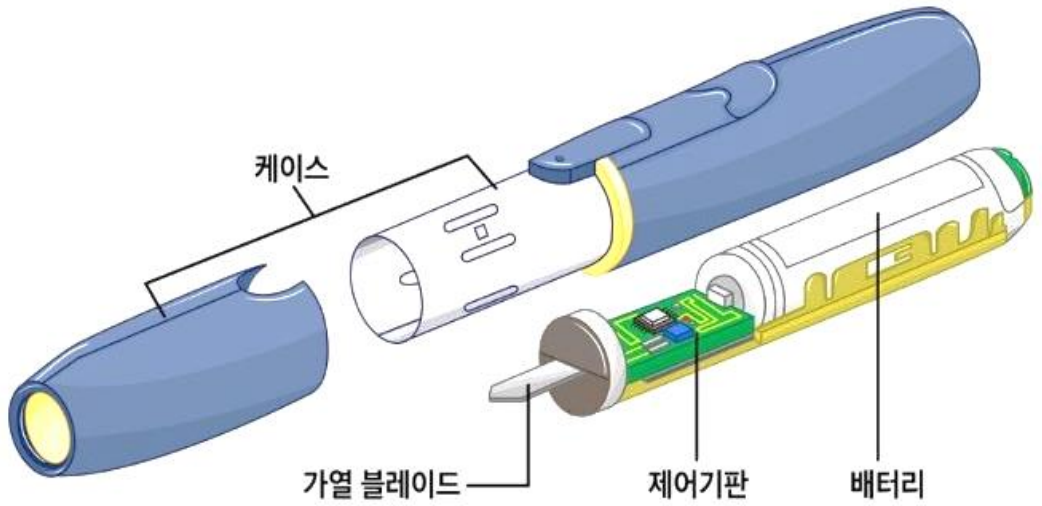
기획재정부2019

국내 궐련형 전자담배 판매 변화



기획재정부2019

Heat-Not-Burn(HNB) IQOS 구조



금연 진료지침 앱2018

Heat-not-burn (HNB) devices may not be a safer option than cigarette smoking or e-Cigarette

- HNBs are hybrids between e-Cigs and traditional cigarettes
- Device that heats the product, without burning to generate aerosol and the product being heated is real tobacco
- Both e-Cigs and IQOS may represent a gateway for nicotine addiction among never-smokers rather than a substitute used for harm-reduction purposes in current smokers

Liu X et al. Tob Control 2018;28:113-114

IQOS(HNB) exposure impairs human airway cell homeostasis

- IQOS exposure contributes to altered mitochondrial function which can further exaggerate airway inflammation, airway remodelling and lung cancer.[1]
- IQOS may increase respiratory infections

1.Guerra F et al. Front Oncol 2017;7:295

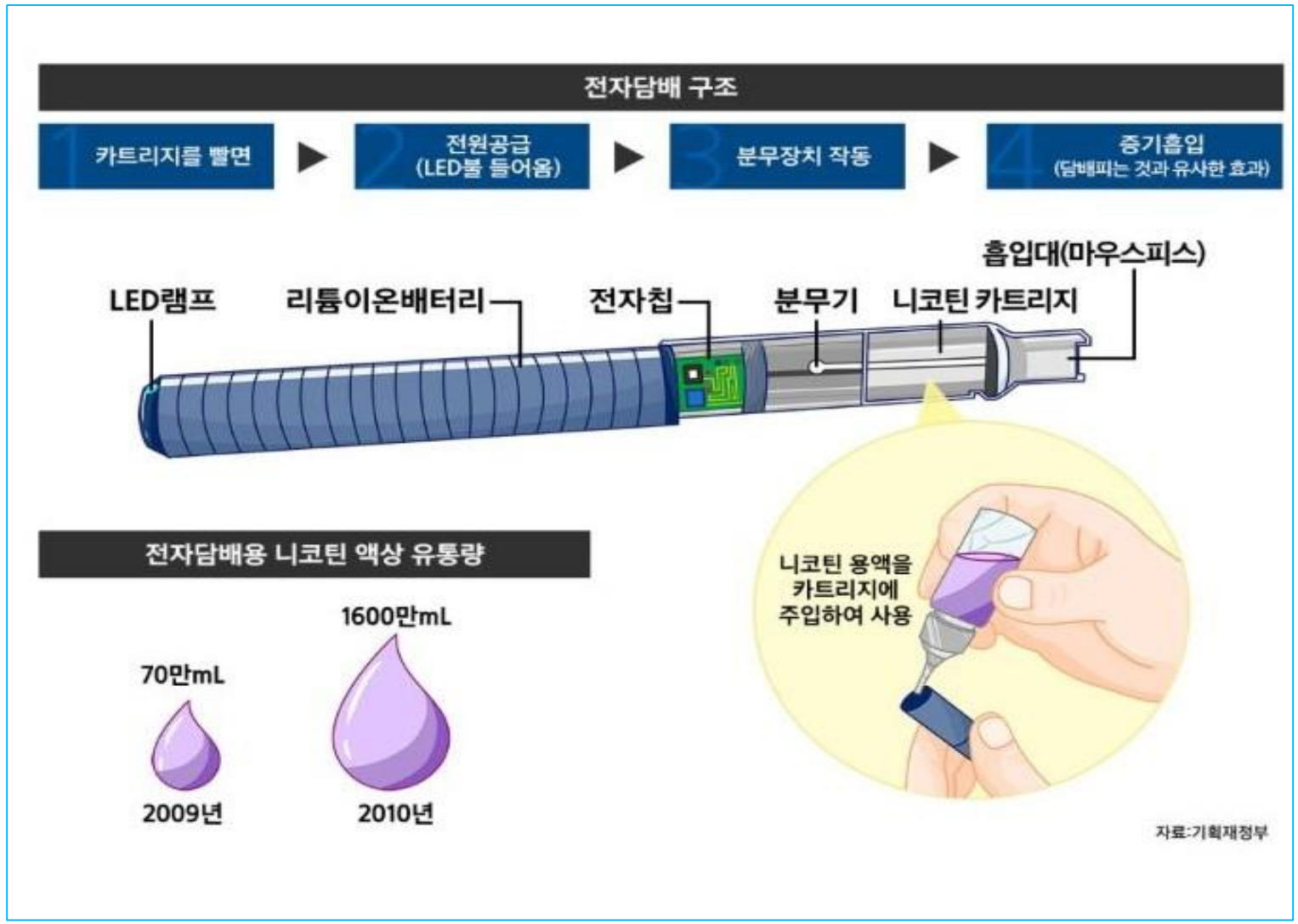
2. Miyashita L et al. Eur Respir J 2018;57:1701592

Carbonyl emissions from a novel heated tobacco product: comparison with an e-cigarette and a tobacco cigarette

µg/mg nicotine yield	Formaldehyde	Acetaldehyde	Acrolein	Propionaldehyde	Crotonaldehyde
IQOS	5.3	120.1	9.0	10.7	1.6
E-cigarette	0.5	0.8	0.3	<LOD	<LOD
Tobacco Cigarette	36.7	580.4	61.6	59.4	22.5

Farsalinos KE et al. Addiction 2018 113:2099-2106

액상형 전자담배 구조

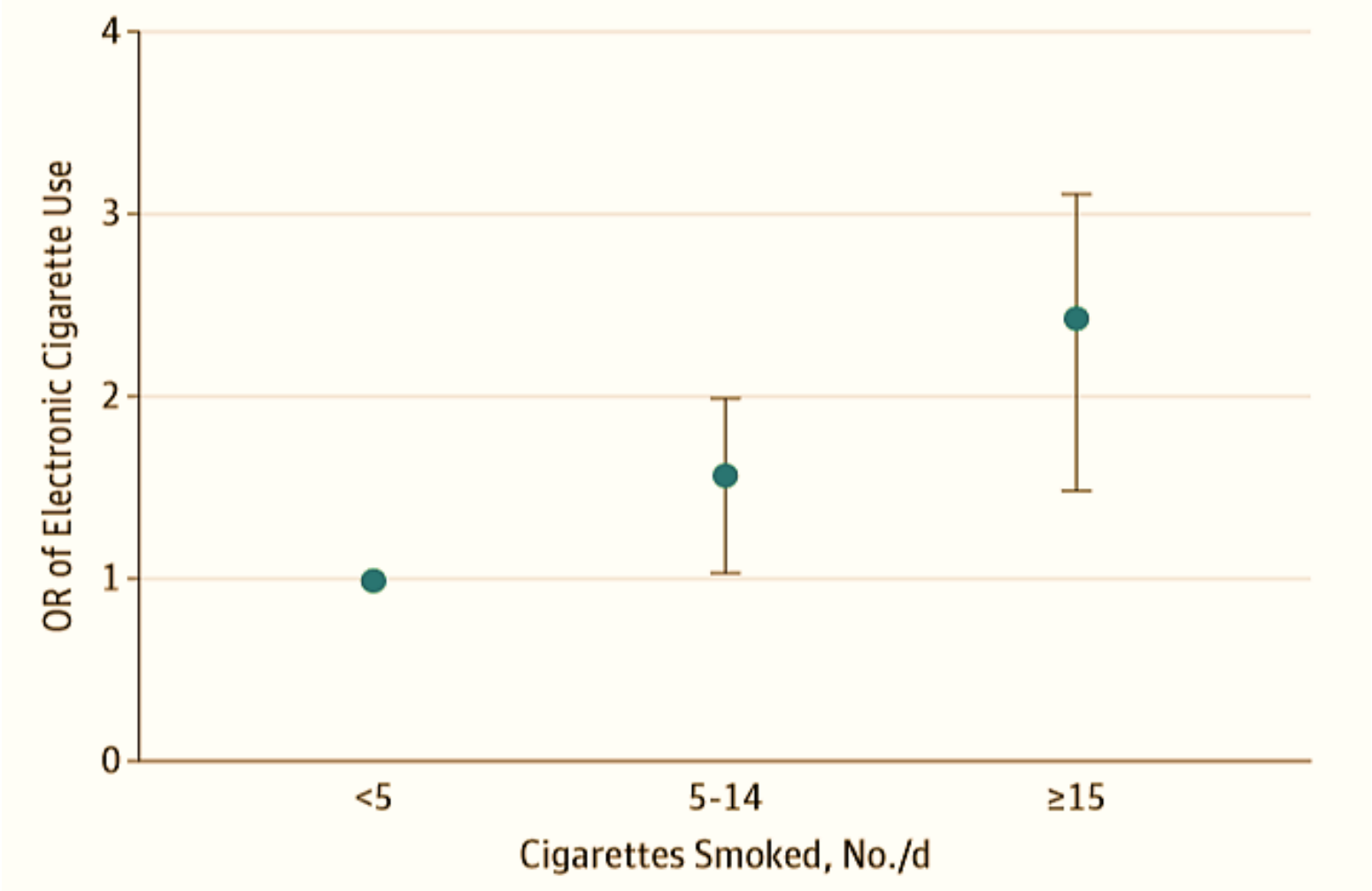

전자담배 구조
1 카트리지를 빨면
2 전원공급 (LED불 들어옴)
3 분무장치 작동
4 증기흡입 (담배피는 것과 유사한 효과)
흡입대(마우스피스)
LED램프
리튬이온배터리
전자칩
분무기
니코틴 카트리지
니코틴 용액을 카트리지에 주입하여 사용
전자담배용 니코틴 액상 유통량
70만mL
2009년
1600만mL
2010년
자료:기획재정부

Association of e-cigarette use with smoking habits, demographic factors, and respiratory symptoms n=30272

Factor	OR (95% CI)
Sex	
Men	1.35 (1.12–1.62)
Women	1 [Reference]
Age, y	
20–29	2.77 (1.90–4.05)
30–39	2.27 (1.53–3.36)
40–49	1.65 (1.11–2.44)
50–59	1.47 (1.01–2.12)
60–69	0.96 (0.66–1.39)
70–75	1 [Reference]
Educational level	
Primary school	1.99 (1.51–2.64)
Upper secondary school	1.57 (1.25–1.96)
Higher education	1 [Reference]
Smoking habits	
None	1 [Reference]
Former	2.37 (1.73–3.24)
Current	18.10 (14.19–23.09)
Study	
OLIN	1 [Reference]
WSAS	1.65 (1.27–2.15)

Hedman L et al. JAMA Netw Open 2018 Jul 6;1(3):e180789

Electronic cigarette use in relation to number of conventional cigarettes per day among smokers



Hedman L et al. JAMA Netw Open 2018 Jul 6;1(3):e180789

Participants reporting any respiratory symptoms in relation to smoking habits and e-cigarette use,

Smoking and E-cigarette Use	OR (95% CI)	
	Unadjusted	Adjusted[a]
Nonsmoker		
No e-cigarette use	1 [Reference]	1 [Reference]
E-cigarette use	1.62 (1.06-2.47)	1.46 (0.93-2.29)
Former smoker		
No e-cigarette use	1.25 (1.17-1.33)	1.27 (1.19-1.36)
E-cigarette use	1.52 (0.95-2.43)	1.47 (0.91-2.37)
Smoker		
No e-cigarette use	2.59 (2.40-2.81)	2.55 (2.36-2.77)
E-cigarette use	3.98 (3.21-4.93)	4.03 (3.23-5.02)

Hedman L et al. JAMA Netw Open 2018 Jul 6;1(3):e180789

E-cigarette Use Among Young Adults in the U.S.

18 to 35years (N=12,415)

- Among cigarette smokers, e-cigarette use was associated with higher odds of tobacco use disorder (AOR=2.58, 95% CI=1.73, 3.83) and daily cigarette smoking (AOR=1.67, 95% CI=1.73, 3.83)

- Among lifetime smokers, e-cigarette use was associated with lower odds of stopping smoking (AOR=0.14, 95% CI=0.08, 0.23) and lower odds of a 50% reduction in cigarettes smoked per day (AOR=0.63, 95% CI=0.43, 0.93)

- Only 13.1% of young adults who ever used e-cigarettes reported using them to help stop or quit smoking

Olfson M et al.AM J Prev Med 2019;56(5):655-663

Association of Electronic Cigarette Use With Subsequent Initiation of Tobacco Cigarettes in US Youths(aged 12-15)

Prior Tobacco Product Use[a]	Ever Cigarette Use			Current Cigarette Use		
	Adjusted OR (95% CI)[b]	*P* Value	Adjusted, %[c]	Adjusted OR (95% CI)[b]	*P* Value	Adjusted, %[c]
None	1 [Reference]	NA	4.3	1 [Reference]	NA	1.5
Prior e-cigarette use	4.09 (2.97-5.63)	<.001	13.8	2.75 (1.60-4.73)	<.001	4.0
Prior other product use	3.84 (2.63-5.63)	<.001	13.2	3.43 (1.88-6.26)	<.001	4.8

Cigarette Use at Wave3 by Prior Tobacco Product Use Among 6123 Youths Aged 12 to 15 Years, Population Assessment of Tobacco and Health Study, 2013-2016

Berry KM et al. JAMA Netw Open. 2019;2(2):e187794

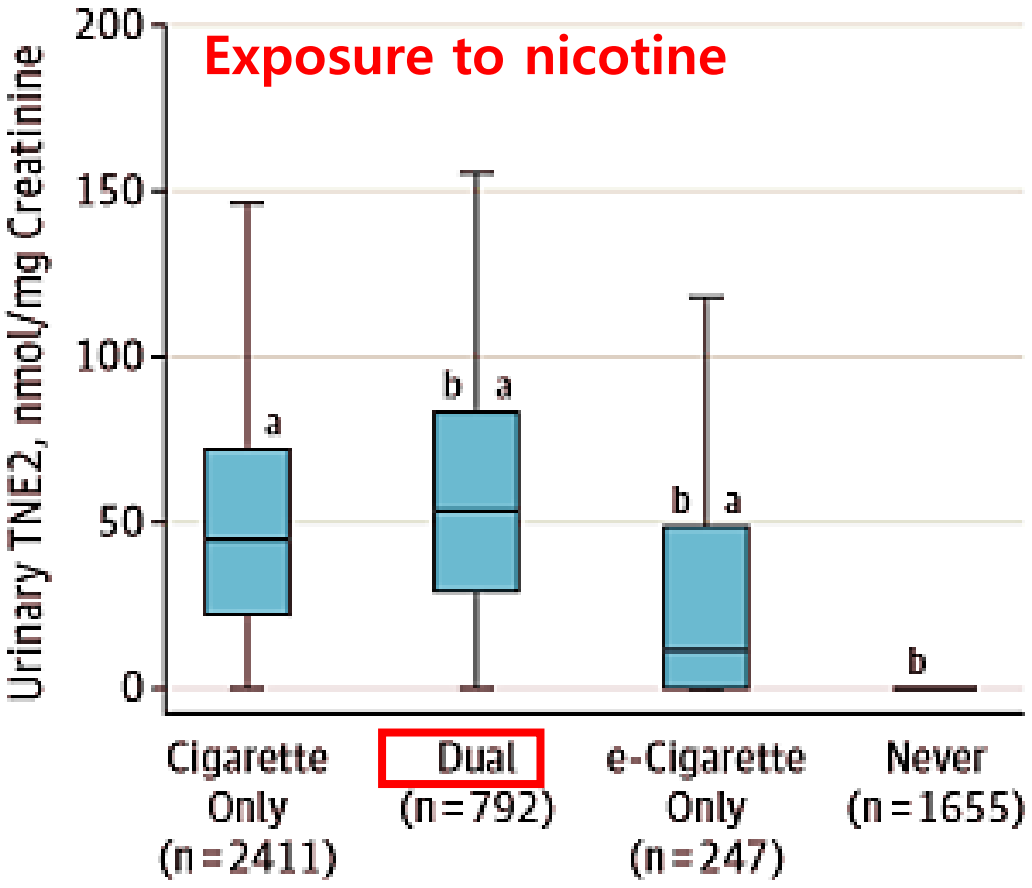
Frequency of e-cigarette use according to reason for e-cigarette use among ever e-cigarette use

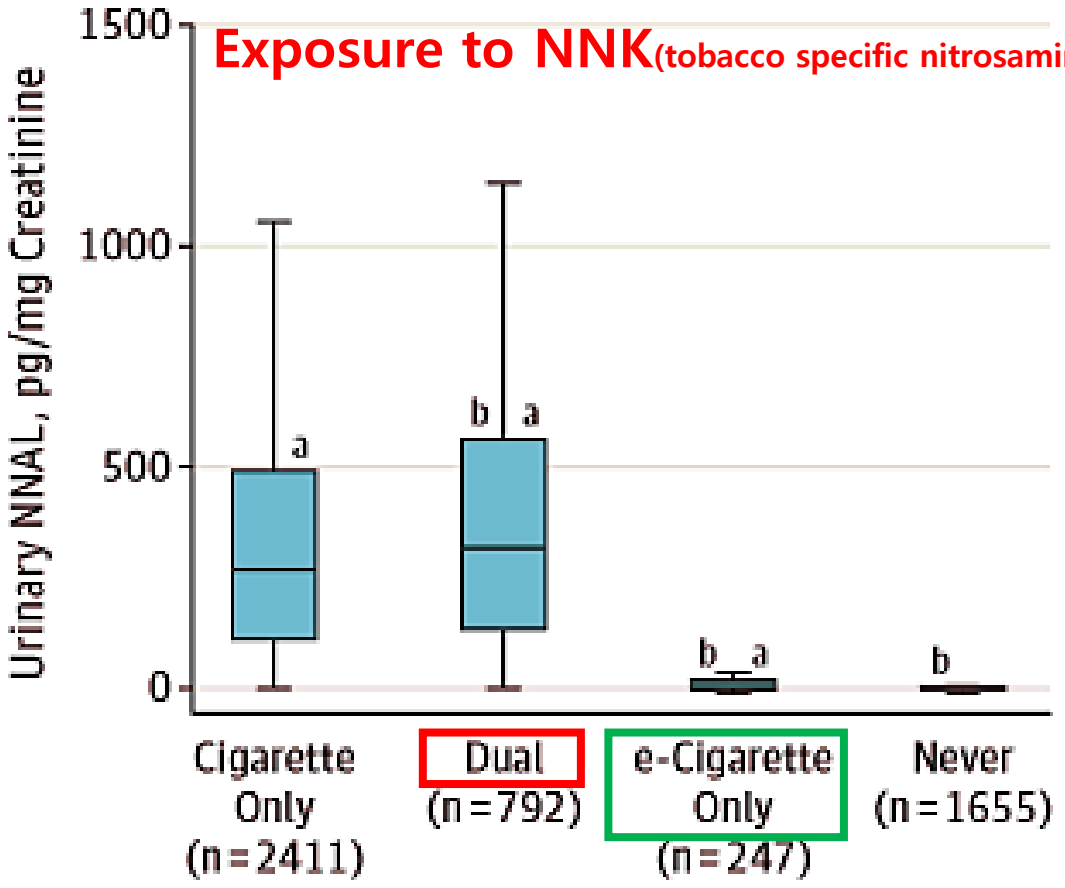
Using the 2015 Korean Youth Risk Behavior Web-Based Survey(n=6656)

Reason for E-Cigarette Use	Number of Days Used E-Cigarettes, % (95% CI) *				
	N (%) †	0–2	3–9	≥10	*p*-Value
N (%) ‡	6656 (100)	4962 (73.7)	669 (10.2)	1024 (16.1)	
Since they might be less harmful	1254 (18.9)	19.3 (18.0–20.7)	17.9 (15.1–21.0)	17.6 (15.3–20.1)	<0.001
For smoking cession	851 (13.1)	10.6 (9.5–11.7)	18.7 (15.6–22.2)	21.0 (18.1–24.3)	
For indoor use	675 (10.7)	7.9 (7.2–8.7)	17.0 (14.0–20.3)	19.5 (17.0–22.3)	
Since they are easily obtained	94 (1.5)	0.6 (0.4–0.9)	5.2 (3.6–7.5)	3.0 (2.1–4.3)	
Since they have better taste	658 (9.6)	9.0 (8.1–10.0)	12.6 (10.2–15.6)	10.5 (8.6–12.8)	
Since they have good flavor	613 (9.3)	10.0 (9.1–10.9)	7.2 (5.4–9.7)	7.2 (5.6–9.1)	
Since they do not have the smoking smell	491 (7.5)	6.4 (5.7–7.2)	7.5 (5.5–10.2)	12.5 (10.4–15.0)	
Curiosity	1572 (22.9)	28.8 (27.3–30.4)	10.2 (7.8–13.1)	3.9 (2.9–5.4)	
Other	447 (6.6)	7.4 (6.6–8.2)	3.7 (2.4–5.6)	4.7 (3.5–6.4)	

Lee JA et al. Int. J. Environ. Res. Public Health **2017**, 14, 305

Comparison of nicotine and toxicant exposure in users of electronic cigarettes and combustible cigarettes.



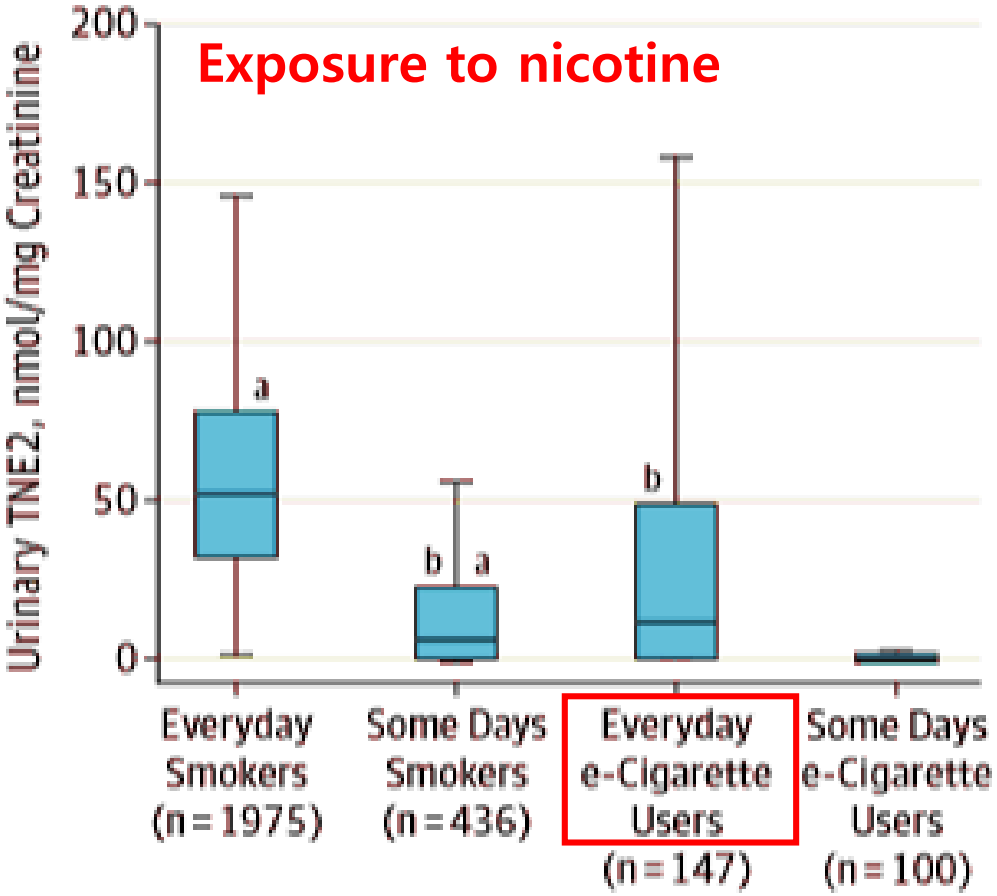


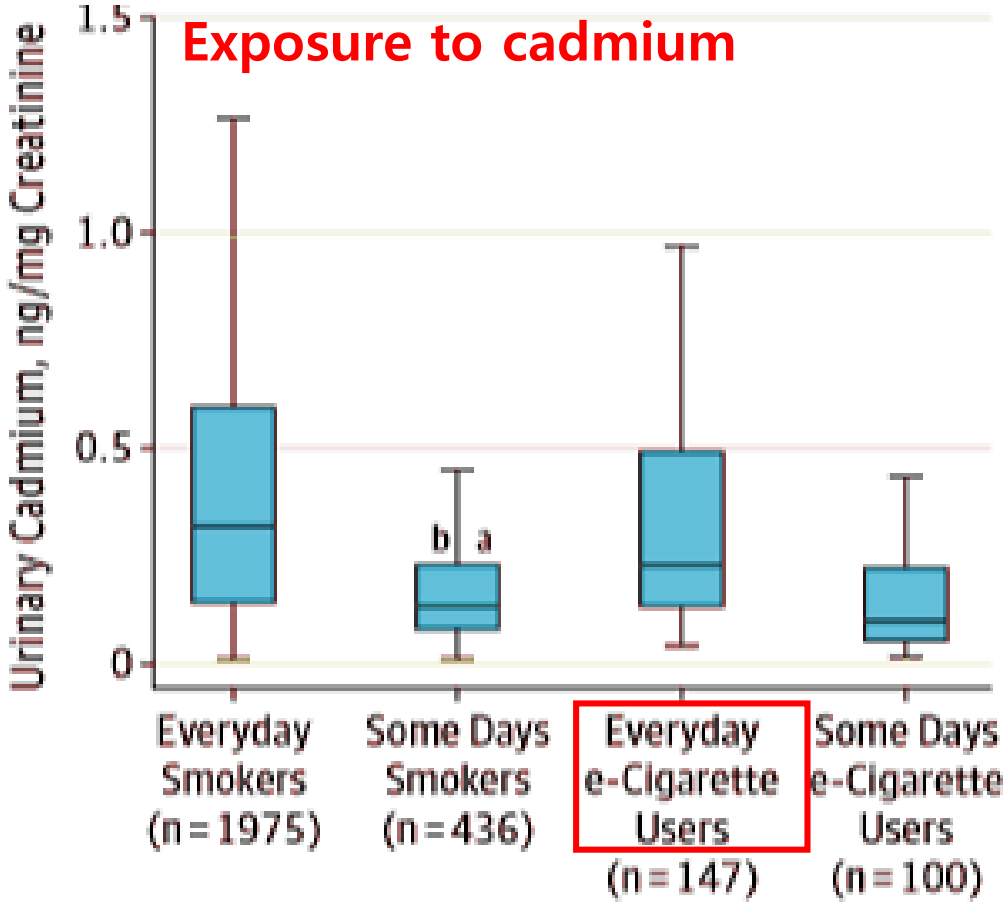
a Statistically significant difference from never users,
b Statistically significant difference cigarette-only users

Goniewicz ML et al. Ajama Netw Open 2018 Dec7;(8):e185937

Biomarkers of exposure among e-cigarette only users and cigarette-only smokers

Population Assessment of Tobacco and Health Study,Wave1,2013-2014(n = 2658)





a. Statistically significant difference with everyday e cigarette users
b. Statistically significant difference with everyday smokers

Goniewicz ML et al. JAMA Netw Oepn 2018 Dec7;(8):e185937

Nicotine containing e-cigarette : other harmful effects in human lung except addiction

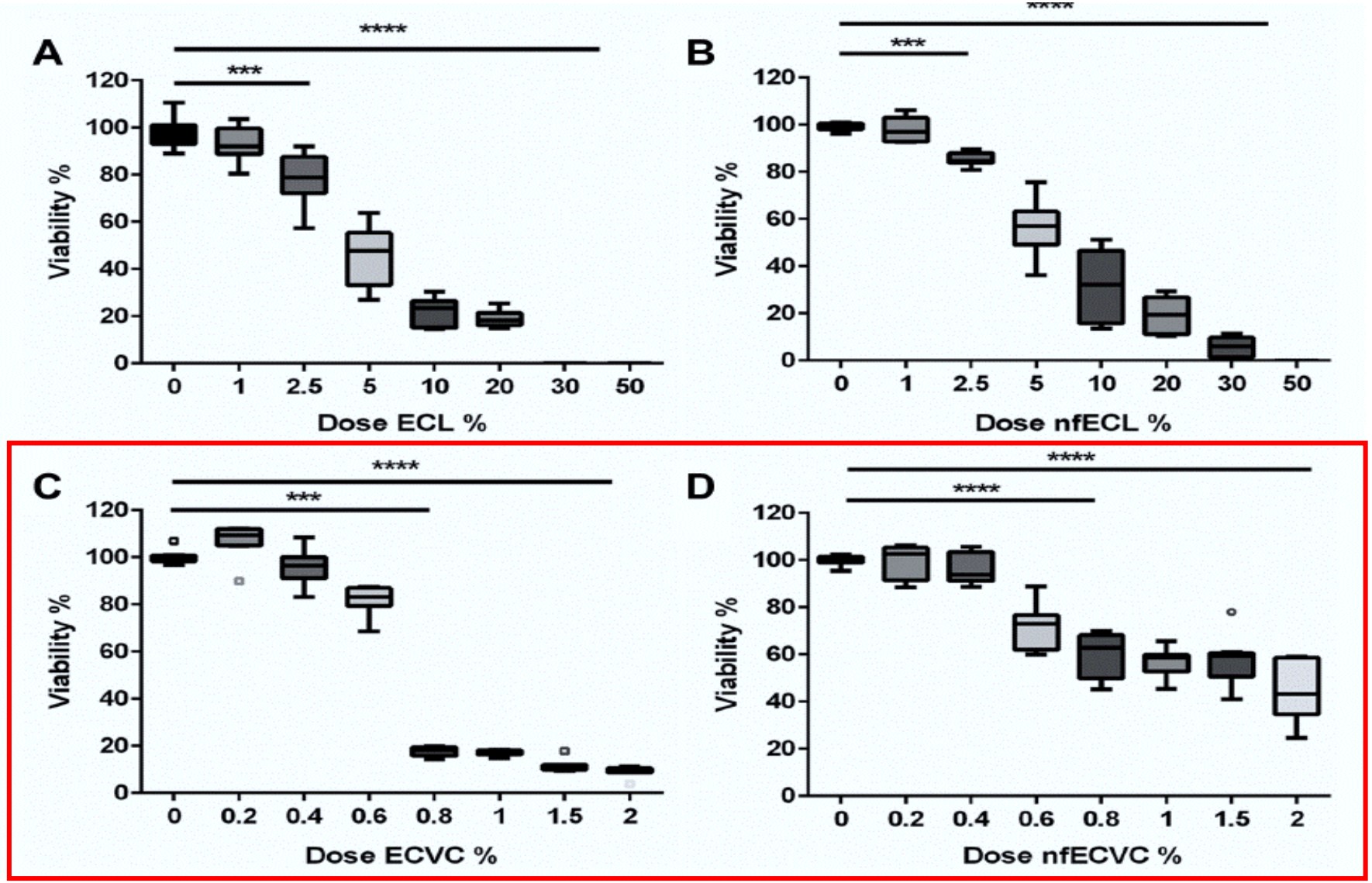
① Which is more harmful between e-cigarette liquid vs vapour condensate in human lung tissue?

① Can we believe that e-cigarette containing nicotine is safe except addiction ?

① What are the adverse effects of nicotine containing e-cigarette(JUUL) to human lung?

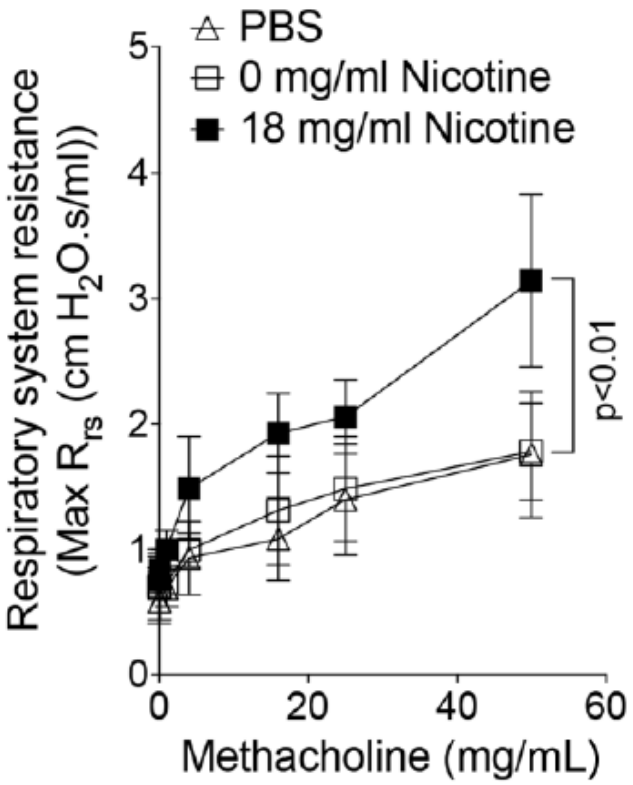
Pro-inflammatory effects of e-cigarette vapour condensate on human alveolar macrophages

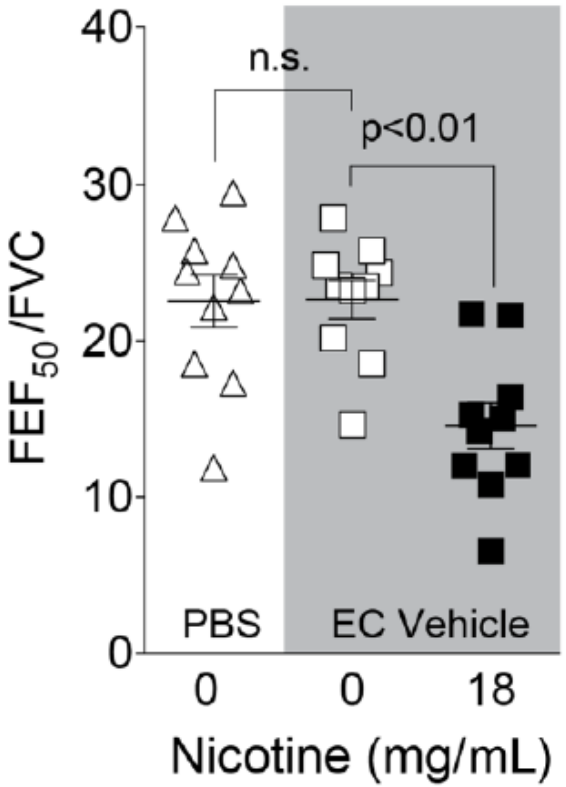
Effect of e-cigarette vapour condensate (ECVC) and -cigarette liquid (ECL).

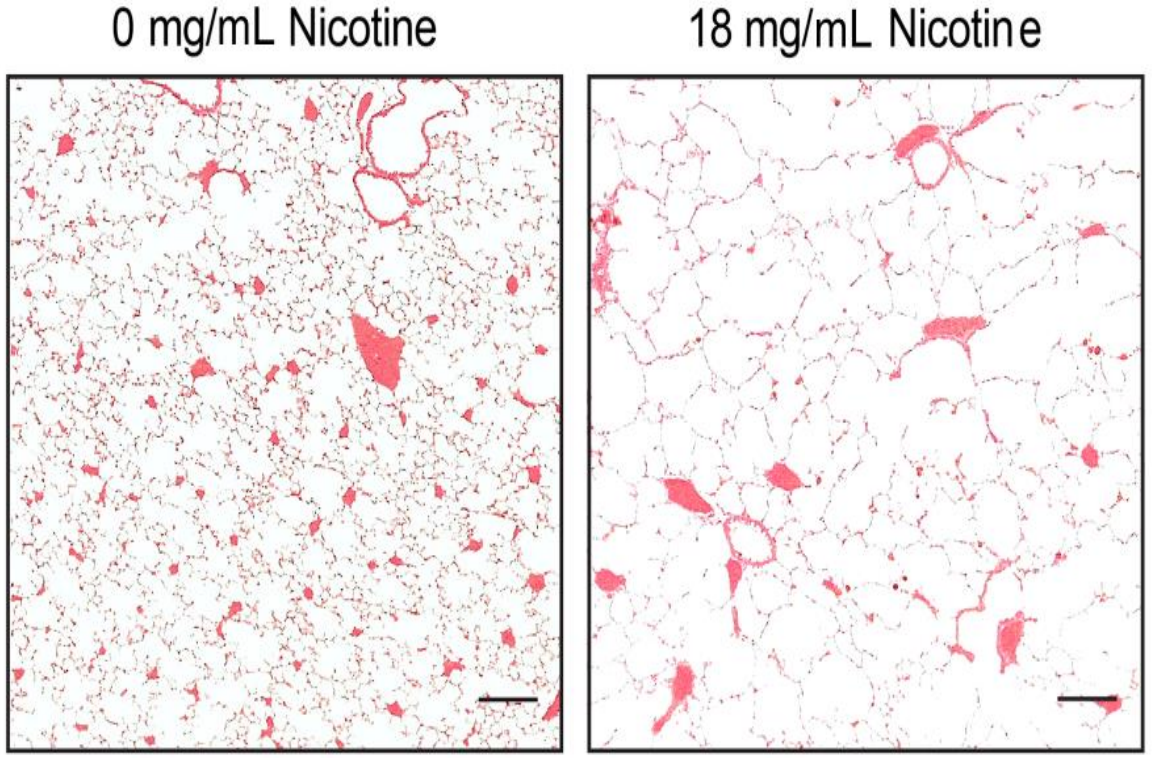


Scott A et al. Thorax 2018 ;73(12):1161

Chronic electronic cigarette exposure in mice induces features of COPD in a nicotine-dependent manner



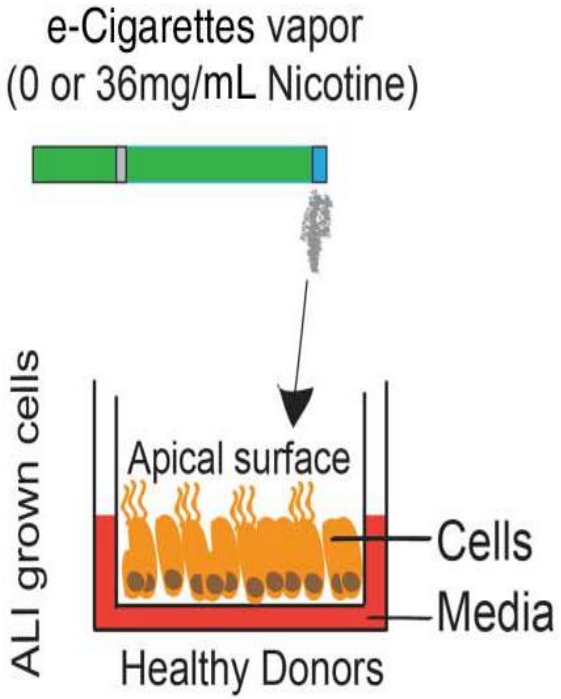


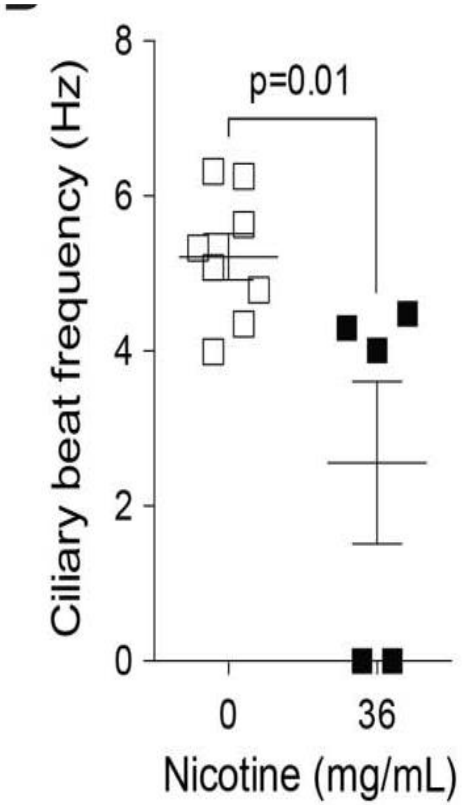


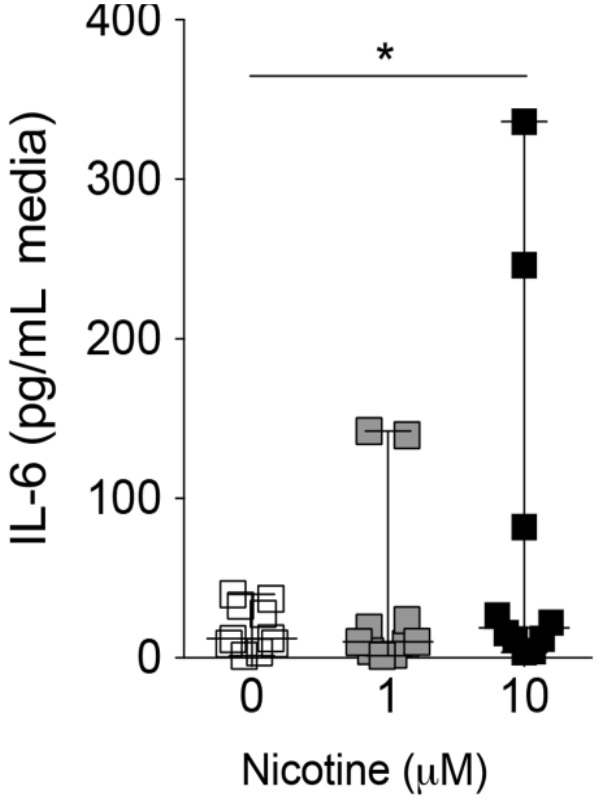
Garcia Arcos I et al. Thorax2016 Dec;71(12):1119-1129.

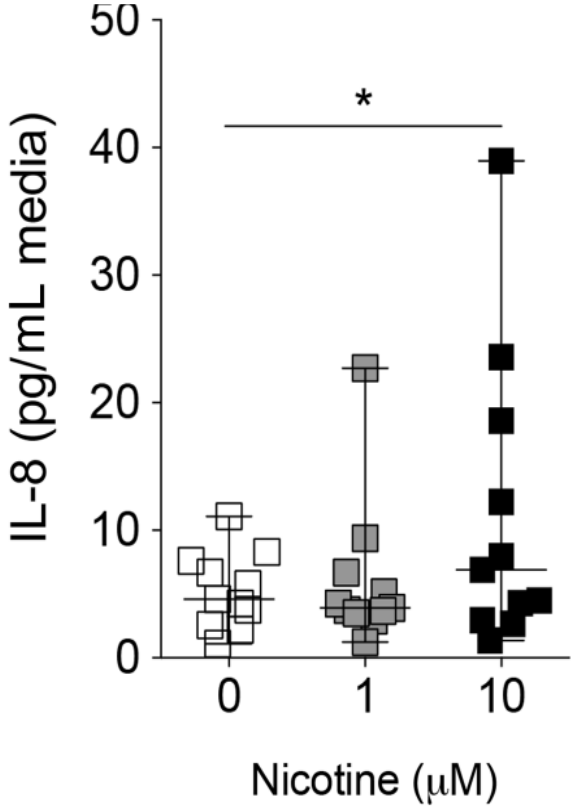
Nicotine directly alters ciliary function and cytokine production in NHBE cells

potential dangers of nicotine inhalation during e-cigarette use









Garcia Arcos I et al. Thorax2016 Dec;71(12):1119-1129.

JUUL (CSV) 2019- 5-24 국내 발매

JUUL DEVICE

JUUL PODS CONTAIN

① Propyleneglycol &glycerine

② Nicotine

③ Benzoic acid

④ Flavour

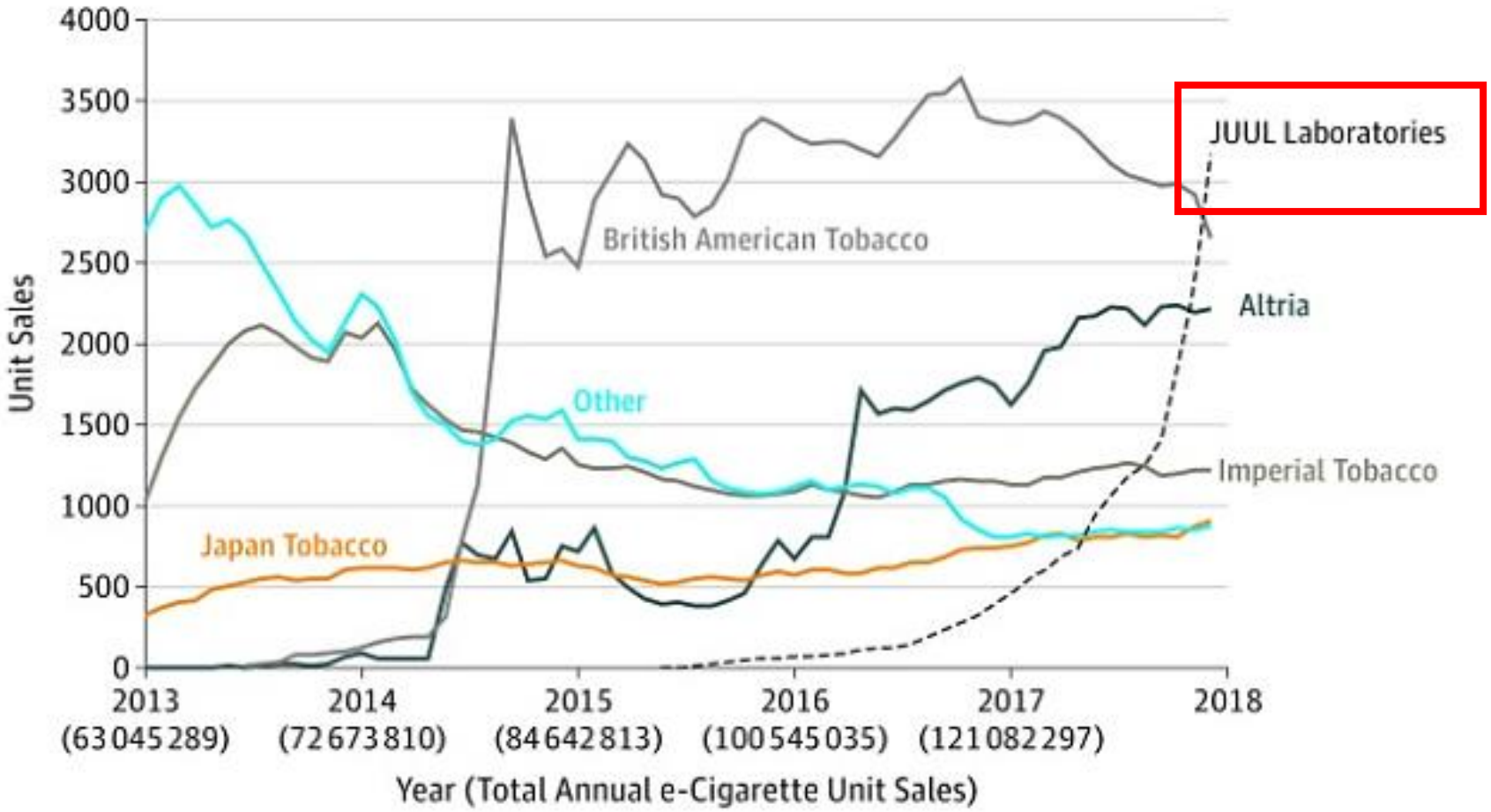
- JUUL is a closed system vapour (CSV) product and is not refillable.
- JUUL is rechargeable via a USB port.

JUUL e-cigarettes(Juuling)

- 1 nicotine concentration: 59 mg/mL
- JUUL pod contain 0.7 mL with 5% nicotine equivalent to 1 pack of cigarettes or 200 puffs
- Hide the e-cigarettes in one's hand or unfamiliar with the design, to even be an e-cigarette
- Populare cigarette Juul's sale shave surged almost 800 % over the past year. *www.cnbc. com/2018/07/02*

Mckelvey K. et a. JAMA Netw Open 2018;1(6):e183535

Electronic Cigarette Sales in the United States, 2013-2017



Braian A et al. JAMA. 2018 Oct 2; 320(13): 1379–1380

Use of Pod-Based e-Cigarettes(Juul), Other e-Cigarettes, and Cigarettes Among 437 California Adolescents and Young Adults

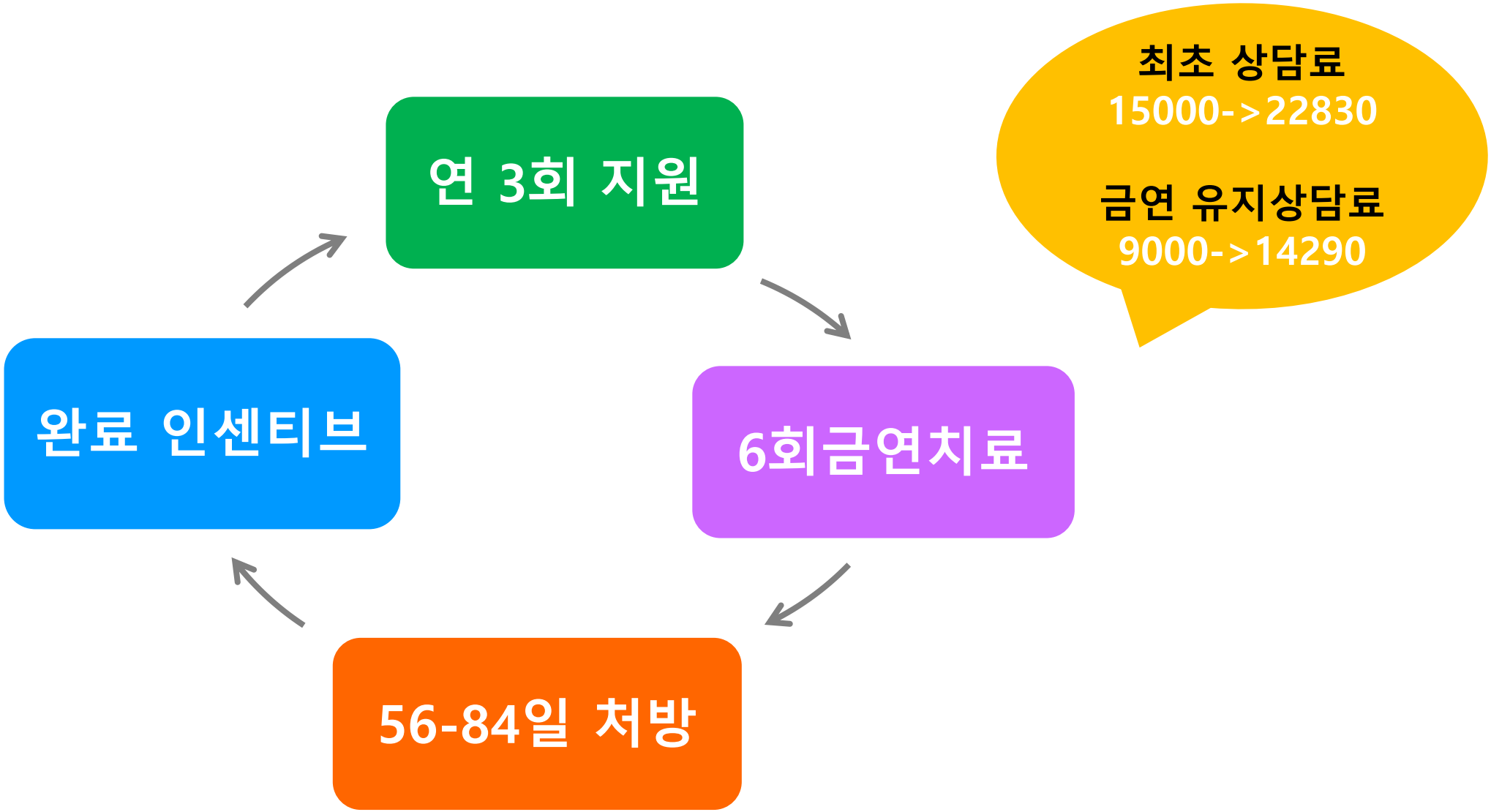
Product	Ever Use, No. (%)	Any Past 30-d Use, No./Total No. (%)	Past 30-d Use, Mean (SD), d	Any Past 7-d Use, No./Total No. (%)	Past 7-d Use, Mean (SD), d
Pod-based e-cigarettes	68 (15.6)	40/68 (58.8)	6.7 (10.0)	25/68 (36.8)	1.5 (2.4)
Other e-cigarettes	133 (30.4)	40/133 (30.1)	3.2 (7.4)	26/133 (19.5)	0.8 (1.8)
Cigarettes	106 (24.3)	30/106 (28.3)	3.0 (7.6)	17/106 (16.0)	0.7 (1.8)

Mckelvey K. et a. JAMA Netw Open 2018;1(6):e183535

국내 금연 지원사업 현황

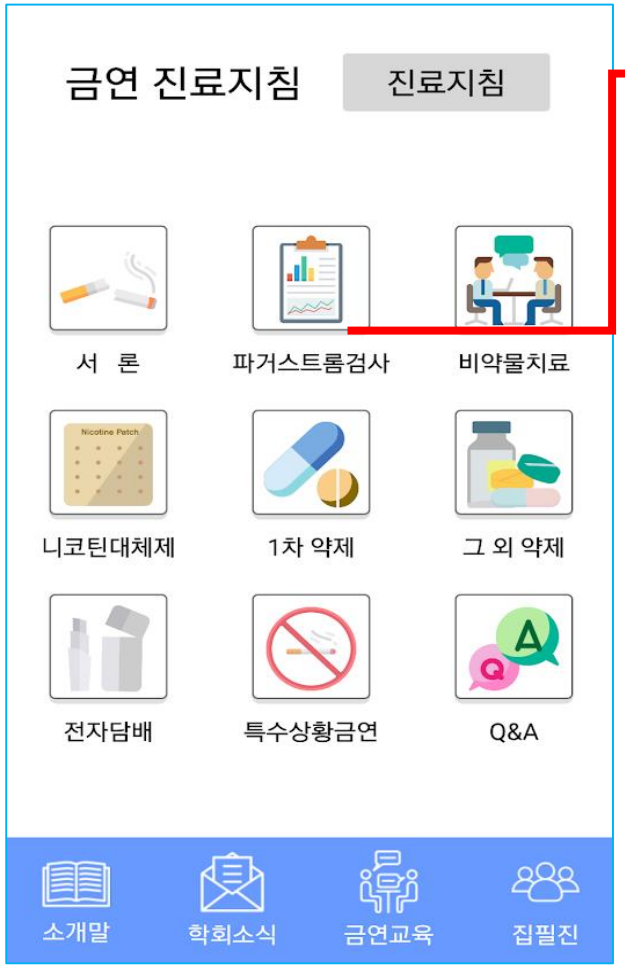
- 금연 상담전화
- 보건소 금연 클리닉
- 병 의원 금연치료
- 찾아가는 금연서비스
- 금연캠프: 합숙형 전문치료형(4박5일),일반지원형(1박2일)
- 금연치료: 건강보험 지원 검토(2020)

병 의원 금연치료 지원 사업

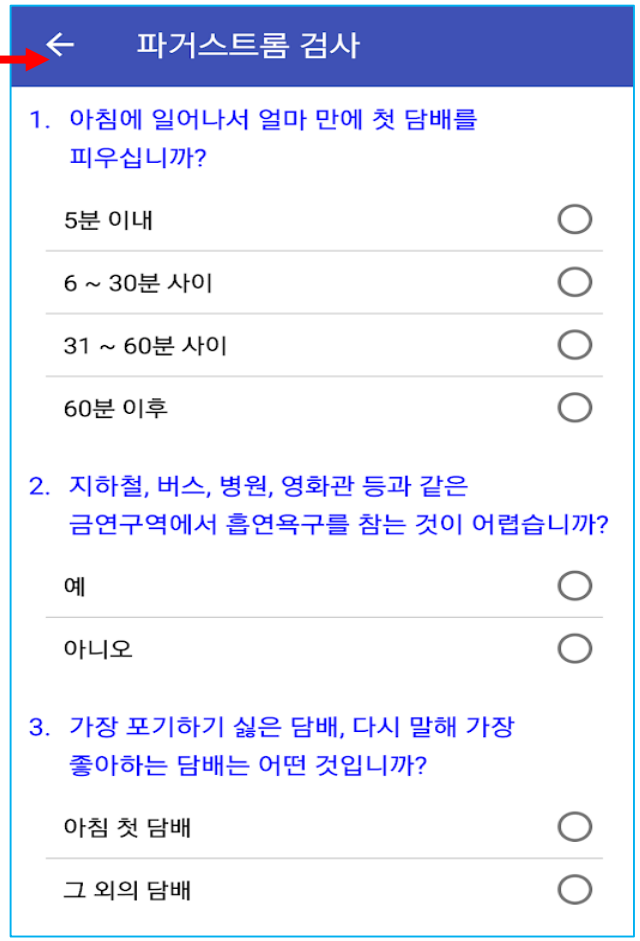


금연 진료지침 App(2018)

금연 진료지침 항목



세부항목(퍼거스트롬 검사)



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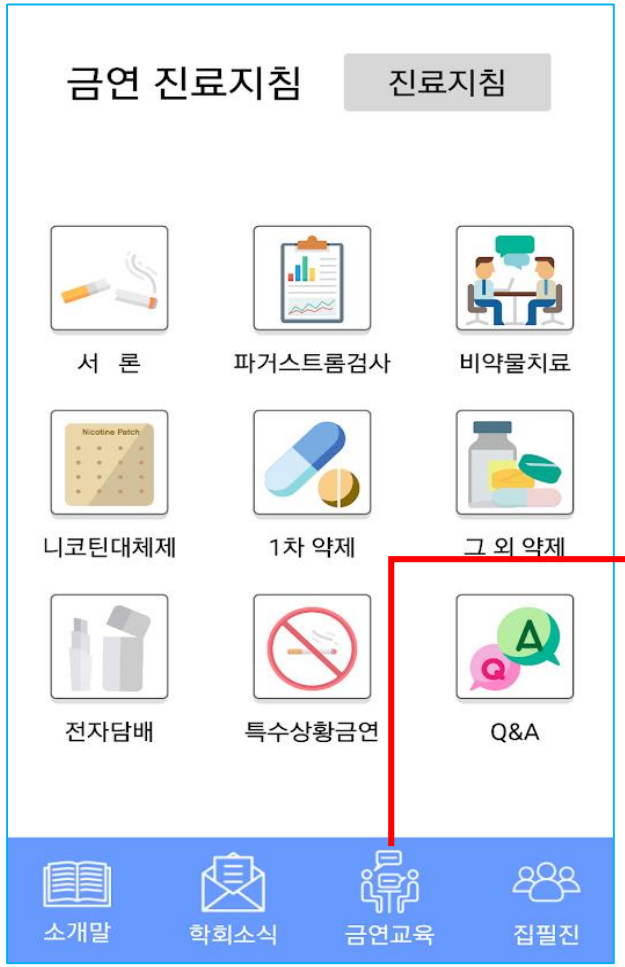

경청해 주셔서 감사합니다