Smoking Cessation in the Oncology Setting - How Smoking Adversely Affects Cancer Treatments and Outcomes

Ellen R. Gritz, Ph.D.
Professor and Chair
Olla S. Stribling Distinguished Chair for Cancer Research
Department of Behavioral Science

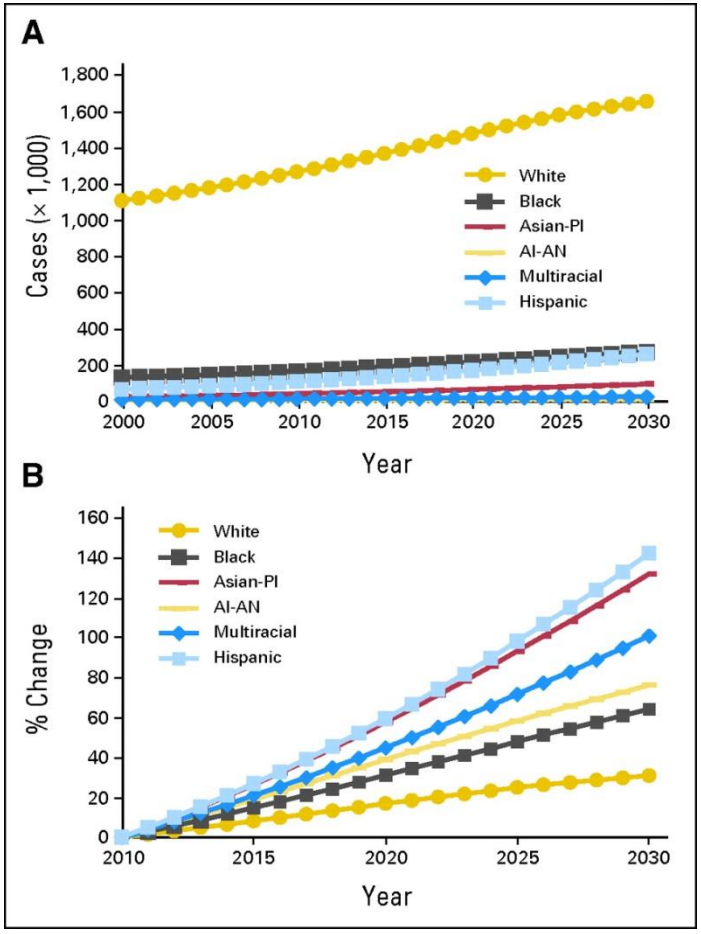
8th Annual Conference on Health Disparities: The Intersection of Smoking, HIV/AIDS and Cancer
University of North Texas Health Science Center
Fort Worth, Texas
May 30, 2013

THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center
Making Cancer History®

Overview

- Cancer incidence and projected disparities
- Cancer mortality and survivor trends
- Smoking prevalence among cancer survivors
- Adverse effects of smoking on cancer treatments and outcomes
- Addressing tobacco use in the oncology setting
- NCI conference on Treating Tobacco Dependence at Cancer Centers
- MD Anderson Tobacco Treatment Program
- Policy Implications

Disparities in Estimated Cancer Incidence from 2010-2030

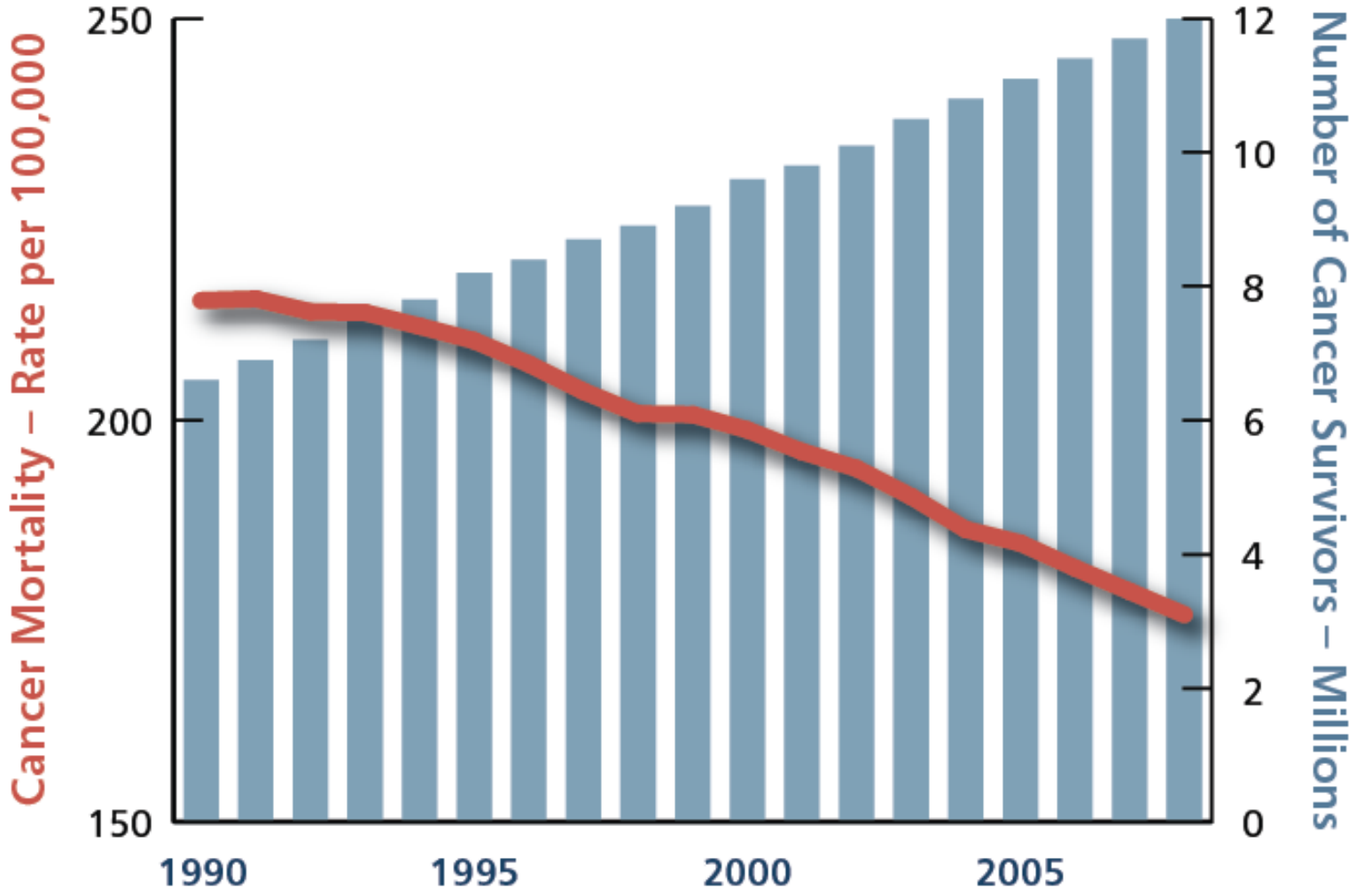


Projected cases of all invasive cancers in the United States by race and origin. (*) Nonmelanoma skin cancers were excluded from projections. The Hispanic origin group contains individuals of any race. The race groups white, black, Asian/Pacific Islander (PI), American Indian (AI)/Alaska Native (AN), and multiracial contain only non-Hispanic individuals.

- **From 2010-30, total cancer incidence will increase by an additional 45% from 1.6 to 2.3 million, driven disproportionately by age and race/ethnicity**
- **A 67% increase is anticipated for patients ≥ 65 years, compared to 11% for patients ≤ 65**
- **A 99% increase is anticipated for minorities, compared to 31% for whites**
- **Percentage of all cancers diagnosed in minorities will increase from 21% to 28%**

Smith BD, Smith GL, Hurria A, Hortobagyi GN, Buchholz TA, *JCO*, 27:2758-2765, 2009

Cancer in the United States, 1990-2008: Survival Rising, Mortality Decreasing



Data from the National Cancer Institute on estimated number of cancer survivors and age-adjusted cancer deaths per 100,000 people

Cigarette Smoke

- **Largest single contributor to cancer risk**
  - **Shifting views on largest contribution to preventable health risks as compared with obesity**
- **Over 7000 constituents in cigarette smoke**
  - **60+ known carcinogens**
    - **Aldehydes**
    - **Benzene**
    - **Metals (cadmium, nickel, polonium)**
    - **Nicotine**
    - **Nitrosamines**
    - **Polyaromatic hydrocarbons**
- **Large number of additives**
  - **Enhance absorption**
  - **Increase flavor**
  - **Increase addiction**

Additives to Cigarettes (~600)

Here are the first 65 (alphabetical order)

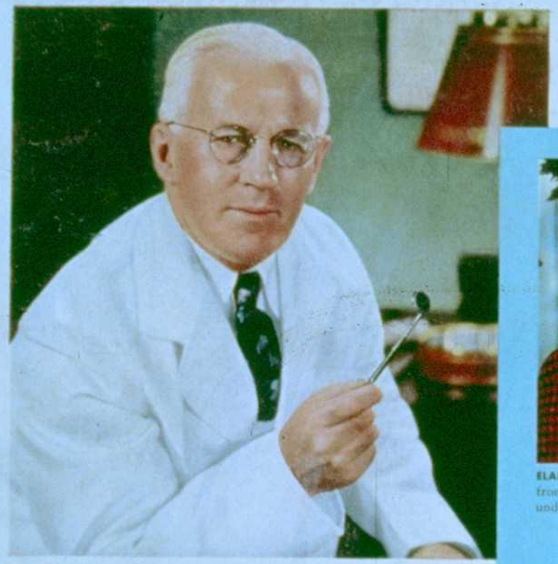
Acetanisole
Acetic Acid
Acetoin
Acetophenone
6-Acetoxydihydrotheaspirane
2-Acetyl-3- Ethylpyrazine
2-Acetyl-5-Methylfuran
Acetylpyrazine
2-Acetylpyridine
3-Acetylpyridine
2-Acetylthiazole
Aconitic Acid
dl-Alanine
Alfalfa Extract
Allspice Extract,Oleoresin, and Oil
Allyl Hexanoate
Allyl Ionone
Almond Bitter Oil
Ambergris Tincture
Ammonia
Ammonium Bicarbonate
Ammonium Hydroxide
Ammonium Phosphate Dibasic
Ammonium Sulfide
Amyl Alcohol
Amyl Butyrate
Amyl Formate
Amyl Octanoate
alpha-Amylcinnamaldehyde
Amyris Oil
trans-Anethole
Angelica Root Extract, Oil and Seed Oil
Anise
Anise Star, Extract and Oils
Anisyl Acetate
Anisyl Alcohol
Anisyl Formate
Anisyl Phenylacetate
Apple Juice Concentrate, Extract, and Skins
Apricot Extract and Juice Concentrate
1-Arginine
Asafetida Fluid Extract And Oil
Ascorbic Acid
1-Asparagine Monohydrate
1-Aspartic Acid
Balsam Peru and Oil
Basil Oil
Bay Leaf, Oil and Sweet Oil
Beeswax White
Beet Juice Concentrate
Benzaldehyde
Benzaldehyde Glyceryl Acetal
Benzoic Acid, Benzoin
Benzoin Resin
Benzophenone
Benzyl Alcohol
Benzyl Benzoate
Benzyl Butyrate
Benzyl Cinnamate
Benzyl Propionate
Benzyl Salicylate
Bergamot Oil
Bisabolene
Black Currant Buds Absolute
Borneol

Additives to Cigarettes (~600)

Acetanisole, Acetic Acid, Acetoin, Acetophenone, 6-Acetoxydihydrotheaspirane, 2-Acetyl-3- Ethylpyrazine, 2-Acetyl-5-Methylfuran, Acetylpyrazine, 2-Acetylpyridine, 3-Acetylpyridine, 2-Acetylthiazole, Aconitic Acid, dl-Alanine, Alfalfa Extract, Allspice Extract,Oleoresin, and Oil, Allyl Hexanoate, Allyl Ionone, Almond Bitter Oil, Ambergris Tincture, Ammonia, Ammonium Bicarbonate, Ammonium Hydroxide, Ammonium Phosphate Dibasic, Ammonium Sulfide, Amyl Alcohol, Amyl Butyrate, Amyl Formate, Amyl Octanoate, alpha-Amylcinnamaldehyde, Amyris Oil, trans-Anethole, Angelica Root Extract, Oil and Seed Oil, Anise, Anise Star, Extract and Oils, Anisyl Acetate, Anisyl Alcohol, Anisyl Formate, Anisyl Phenylacetate, Apple Juice Concentrate, Extract, and Skins, Apricot Extract and Juice Concentrate, 1-Arginine, Asafetida Fluid Extract And Oil, Ascorbic Acid, 1-Asparagine Monohydrate, 1-Aspartic Acid, Balsam Peru and Oil, Basil Oil, Bay Leaf, Oil and Sweet Oil, Beeswax White, Beet Juice Concentrate, Benzaldehyde, Benzaldehyde Glyceryl Acetal, Benzoic Acid, Benzoin, Benzoin Resin, Benzophenone, Benzyl Alcohol, Benzyl Benzoate, Benzyl Butyrate, Benzyl Cinnamate, Benzyl Propionate, Benzyl Salicylate, Bergamot Oil, Bisabolene, Black Currant Buds Absolute, Borneol, Bornyl Acetate, Buchu Leaf Oil, 1,3-Butanediol, 2,3-Butanedione, 1-Butanol, 2-Butanone, 4(2-Butenylidene)-3,5,5-Trimethyl-2-Cyclohexen-1-One, Butter, Butter Esters, and Butter Oil, Butyl Acetate, Butyl Butyrate, Butyl Butyryl Lactate, Butyl Isovalerate, Butyl Phenylacetate, Butyl Undecylenate, 3-Butylidenephthalide, Butyric Acid], Cadinene, Caffeine, Calcium Carbonate, Camphene, Cananga Oil, Capsicum Oleoresin, Caramel Color, Caraway Oil, Carbon Dioxide, Cardamom Oleoresin, Extract, Seed Oil, and Powder, Carob Bean and Extract, beta-Carotene, Carrot Oil, Carvacrol, 4-Carvomenthenol, 1-Carvone, beta-Caryophyllene, beta-Caryophyllene Oxide, Cascarilla Oil and Bark Extract, Cassia Bark Oil, Cassie Absolute and Oil, Castoreum Extract, Tincture and Absolute, Cedar Leaf Oil, Cedarwood Oil Terpenes and Virginiana, Cedrol, Celery Seed Extract, Solid, Oil, And Oleoresin, Cellulose Fiber, Chamomile Flower Oil And Extract, Chicory Extract, Chocolate, Cinnamaldehyde, Cinnamic Acid, Cinnamon Leaf Oil, Bark Oil, and Extract, Cinnamyl Acetate, Cinnamyl Alcohol, Cinnamyl Cinnamate, Cinnamyl Isovalerate, Cinnamyl Propionate, Citral, Citric Acid, Citronella Oil, dl-Citronellol, Citronellyl Butyrate, itronellyl Isobutyrate, Civet Absolute, Clary Oil, Clover Tops, Red Solid Extract, Cocoa, Cocoa Shells, Extract, Distillate And Powder, Coconut Oil, Coffee, Cognac White and Green Oil, Copaiba Oil, Coriander, Extract and Oil, Corn Oil, Corn Silk, Costus Root Oil, Cubeb Oil, Cuminaldehyde, para-Cymene, 1-Cysteine, Dandelion Root Solid Extract, Davana Oil, 2-trans, 4-trans-Decadienal, delta-Decalactone, gamma-Decalactone, Decanal, Decanoic Acid, 1-Decanol, 2-Decenal, Dehydromenthofurolactone, Diethyl Malonate, Diethyl Sebacate, 2,3-Diethylpyrazine, Dihydro Anethole, 5,7-Dihydro-2-Methylthieno(3,4-D) Pyrimidine, Dill Seed Oil and Extract, meta-Dimethoxybenzene, para-Dimethoxybenzene, 2,6-Dimethoxyphenol, Dimethyl Succinate, 3,4-Dimethyl-1,2 Cyclopentanedione, 3,5- Dimethyl-1,2-Cyclopentanedione, 3,7-Dimethyl-1,3,6-Octatriene, 4,5-Dimethyl-3-Hydroxy-2,5-Dihydrofuran-2-One, 6,10-Dimethyl-5,9-Undecadien-2-One, 3,7-Dimethyl-6-Octenoic Acid, 2,4 Dimethylacetophenone, alpha,para-Dimethylbenzyl Alcohol, alpha,alpha-Dimethylphenethyl Acetate, alpha,alpha Dimethylphenethyl Butyrate, 2,3-Dimethylpyrazine, 2,5-Dimethylpyrazine, 2,6-Dimethylpyrazine, Dimethyltetrahydrobenzofuranone, delta-Dodecalactone, gamma-Dodecalactone, para-Ethoxybenzaldehyde, Ethyl 10-Undecenoate, Ethyl 2-Methylbutyrate, Ethyl Acetate, Ethyl Acetoacetate, Ethyl Alcohol, Ethyl Benzoate, Ethyl Butyrate, Ethyl Cinnamate, Ethyl Decanoate, Ethyl Fenchol, Ethyl Furoate, Ethyl Heptanoate, Ethyl Hexanoate, Ethyl Isovalerate, Ethyl Lactate, Ethyl Laurate, Ethyl Levulinate, Ethyl Maltol, Ethyl Methyl Phenylglycidate, Ethyl Myristate, Ethyl Nonanoate, Ethyl Octadecanoate, Ethyl Octanoate, Ethyl Oleate, Ethyl Palmitate, Ethyl Phenylacetate, Ethyl Propionate, Ethyl Salicylate, Ethyl trans-2-Butenoate, Ethyl Valerate, Ethyl Vanillin, 2-Ethyl (or Methyl)-(3,5 and 6)-Methoxypyrazine, 2-Ethyl-1-Hexanol, 3-Ethyl -2 -Hydroxy-2-Cyclopenten-1-One, 2-Ethyl-3, (5 or 6)-Dimethylpyrazine, 5-Ethyl-3-Hydroxy-4-Methyl-2(5H)-Furanone, 2-Ethyl-3-Methylpyrazine, 4-Ethylbenzaldehyde, 4-Ethylguaiacol, para-Ethylphenol, 3-Ethylpyridine, Eucalyptol, Farnesol, D-Fenchone, Fennel Sweet Oil, Fenugreek, Extract, Resin, and Absolute, Fig Juice Concentrate, Food Starch Modified, Furfuryl Mercaptan, 4-(2-Furyl)-3-Buten-2-One, Galbanum Oil, Genet Absolute, Gentian Root Extract, Geraniol, Geranium Rose Oil, Geranyl Acetate, Geranyl Butyrate, Geranyl Formate, Geranyl Isovalerate, Geranyl Phenylacetate, Ginger Oil and Oleoresin, 1-Glutamic Acid, 1-Glutamine, Glycerol, Glycyrrhizin Ammoniated, Grape Juice Concentrate, Guaiac Wood Oil, Guaiacol, Guar Gum, 2,4-Heptadienal, gamma-Heptalactone, Heptanoic Acid, 2-Heptanone, 3-Hepten-2-One, 2-Hepten-4-One, 4-Heptenal, trans -2-Heptenal, Heptyl Acetate, omega-6-Hexadecenlactone, gamma-Hexalactone, Hexanal, Hexanoic Acid, 2-Hexen-1-Ol, 3-Hexen-1-Ol, cis-3-Hexen-1-Yl Acetate, 2-Hexenal, 3-Hexenoic Acid, trans-2-Hexenoic Acid, cis-3-Hexenyl Formate, Hexyl 2-Methylbutyrate, Hexyl Acetate, Hexyl Alcohol, Hexyl Phenylacetate, 1-Histidine, Honey, Hops Oil, Hydrolyzed Milk Solids, Hydrolyzed Plant Proteins, 5-Hydroxy-2,4-Decadienoic Acid delta- Lactone, 4-Hydroxy-2,5-Dimethyl-3(2H)-Furanone, 2-Hydroxy-3,5,5-Trimethyl-2-Cyclohexen-1-One, 4-Hydroxy -3-Pentenoic Acid Lactone, 2-Hydroxy-4-Methylbenzaldehyde, 4-Hydroxybutanoic Acid Lactone, Hydroxycitronellal, 6-Hydroxydihydrotheaspirane, 4-(para-Hydroxyphenyl)-2-Butanone, Hyssop Oil, Immortelle Absolute and Extract, alpha-Ionone, beta-Ionone, alpha-Irone, Isoamyl Acetate, Isoamyl Benzoate, Isoamyl Butyrate, Isoamyl Cinnamate, Isoamyl Formate, Isoamyl Hexanoate, Isoamyl Isovalerate, Isoamyl Octanoate, Isoamyl Phenylacetate, Isobornyl Acetate, Isobutyl Acetate, Isobutyl Alcohol, Isobutyl Cinnamate, Isobutyl Phenylacetate, Isobutyl Salicylate, 2-Isobutyl-3-Methoxypyrazine, alpha-Isobutylphenethyl Alcohol, Isobutyraldehyde, Isobutyric Acid, d,l-Isoleucine, alpha-Isomethylionone, 2-Isopropylphenol, Isovaleric Acid, Jasmine Absolute, Concrete and Oil, Kola Nut Extract, Labdanum Absolute and Oleoresin, Lactic Acid, Lauric Acid, Lauric Aldehyde, Lavandin Oil, Lavender Oil, Lemon Oil and Extract, Lemongrass Oil, 1-Leucine, Levulinic Acid, Licorice Root, Fluid, Extract and Powder, Lime Oil, Linalool, Linalool Oxide, Linalyl Acetate, Linden Flowers, Lovage Oil And Extract, 1-Lysine], Mace Powder, Extract and Oil, Magnesium Carbonate, Malic Acid, Malt and Malt Extract, Maltodextrin, Maltol, Maltyl Isobutyrate, Mandarin Oil, Maple Syrup and Concentrate, Mate Leaf, Absolute and Oil, para-Mentha-8-Thiol-3-One, Menthol, Menthone, Menthyl Acetate, dl-Methionine, Methoprene, 2-Methoxy-4-Methylphenol, 2-Methoxy-4-Vinylphenol, para-Methoxybenzaldehyde, 1-(para-Methoxyphenyl)-1-Penten-3-One, 4-(para-Methoxyphenyl)-2-Butanone, 1-(para-Methoxyphenyl)-2-Propanone, Methoxypyrazine, Methyl 2-Furoate, Methyl 2-Octynoate, Methyl 2-Pyrrolyl Ketone, Methyl Anisate, Methyl Anthranilate, Methyl Benzoate, Methyl Cinnamate, Methyl Dihydrojasmonate, Methyl Ester of Rosin, Partially Hydrogenated, Methyl Isovalerate, Methyl Linoleate (48%), Methyl Linolenate (52%) Mixture, Methyl Naphthyl Ketone, Methyl Nicotinate, Methyl Phenylacetate, Methyl Salicylate, Methyl Sulfide, 3-Methyl-1-Cyclopentadecanone, 4-Methyl-1-Phenyl-2-Pentanone, 5-Methyl-2-Phenyl-2-Hexenal, 5-Methyl-2-Thiophenecarboxaldehyde, 6-Methyl-3,-5-Heptadien-2-One, 2-Methyl-3-(para-Isopropylphenyl) Propionaldehyde, 5-Methyl-3-Hexen-2-One, 1-Methyl-3Methoxy-4-Isopropylbenzene, 4-Methyl-3-Pentene-2-One, 2-Methyl-4-Phenylbutyraldehyde, 6-Methyl-5-Hepten-2-One, 4-Methyl-5-Thiazoleethanol, 4-Methyl-5-Vinylthiazole, Methyl-alpha-Ionone, Methyl-trans-2-Butenoic Acid, 4-Methylacetophenone, para-Methylanisole, alpha-Methylbenzyl Acetate, alpha-Methylbenzyl Alcohol, 2-Methylbutyraldehyde, 3-Methylbutyraldehyde, 2-Methylbutyric Acid, alpha-Methylcinnamaldehyde, Methylcyclopentenolone, 2-Methylheptanoic Acid, 2-Methylhexanoic Acid, 3-Methylpentanoic Acid, 4-Methylpentanoic Acid, 2-Methylpyrazine, 5-Methylquinoxaline, 2-Methyltetrahydrofuran-3-One, (Methylthio)Methylpyrazine (Mixture Of Isomers), 3-Methylthiopropionaldehyde, Methyl 3-Methylthiopropionate, 2-Methylvaleric Acid, Mimosa Absolute and Extract, Molasses Extract and Tincture, Mountain Maple Solid Extract, Mullein Flowers, Myristaldehyde, Myristic Acid, Myrrh Oil, beta-Napthyl Ethyl Ether, Nerol, Neroli Bigarde Oil, Nerolidol, Nona-2-trans,6-cis-Dienal, 2,6-Nonadien-1-Ol, gamma-Nonalactone, Nonanal, Nonanoic Acid, Nonanone, trans-2-Nonen-1-Ol, 2-Nonenal, Nonyl Acetate, Nutmeg Powder and Oil, Oak Chips Extract and Oil, Oak Moss Absolute, 9,12-Octadecadienoic Acid (48%) And 9,12,15-Octadecatrienoic Acid (52%), delta-Octalactone, gamma-Octalactone, Octanal, Octanoic Acid, 1-Octanol, 2-Octanone, 3-Octen-2-One, 1-Octen-3-Ol, 1-Octen-3-Yl Acetate, 2-Octenal, Octyl Isobutyrate, Oleic Acid, Olibanum Oil, Opoponax Oil And Gum, Orange Blossoms Water, Absolute, and Leaf Absolute, Orange Oil and Extract, Origanum Oil, Orris Concrete Oil and Root Extract, Palmarosa Oil, Palmitic Acid, Parsley Seed Oil, Patchouli Oil, omega-Pentadecalactone, 2,3-Pentanedione, 2-Pentanone, 4-Pentenoic Acid, 2-Pentylpyridine, Pepper Oil, Black And White, Peppermint Oil, Peruvian (Bois De Rose) Oil, Petitgrain Absolute, Mandarin Oil and Terpeneless Oil, alpha-Phellandrene, 2-Phenenthyl Acetate, Phenenthyl Alcohol, Phenethyl Butyrate, Phenethyl Cinnamate, Phenethyl Isobutyrate, Phenethyl Isovalerate, Phenethyl Phenylacetate, Phenethyl Salicylate, 1-Phenyl-1-Propanol, 3-Phenyl-1-Propanol, 2-Phenyl-2-Butenal, 4-Phenyl-3-Buten-2-Ol, 4-Phenyl-3-Buten-2-One, Phenylacetaldehyde, Phenylacetic Acid, 1-Phenylalanine, 3-Phenylpropionaldehyde, 3-Phenylpropionic Acid, 3-Phenylpropyl Acetate, 3-Phenylpropyl Cinnamate, 2-(3-Phenylpropyl)Tetrahydrofuran, Phosphoric Acid, Pimenta Leaf Oil, Pine Needle Oil, Pine Oil, Scotch, Pineapple Juice Concentrate, alpha-Pinene, beta-Pinene, D-Piperitone, Piperonal, Pipsissewa Leaf Extract, Plum Juice, Potassium Sorbate, 1-Proline, Propenylguaethol, Propionic Acid, Propyl Acetate, Propyl para-Hydroxybenzoate, Propylene Glycol, 3-Propylidenephthalide, Prune Juice and Concentrate, Pyridine, Pyroligneous Acid And Extract, Pyrrole, Pyruvic Acid, Raisin Juice Concentrate, Rhodinol, Rose Absolute and Oil, Rosemary Oil, Rum, Rum Ether, Rye Extract, Sage, Sage Oil, and Sage Oleoresin, Salicylaldehyde, Sandalwood Oil, Yellow, Sclareolide, Skatole, Smoke Flavor, Snakeroot Oil, Sodium Acetate, Sodium Benzoate, Sodium Bicarbonate, Sodium Carbonate, Sodium Chloride, Sodium Citrate, Sodium Hydroxide, Solanone, Spearmint Oil, Styrax Extract, Gum and Oil, Sucrose Octaacetate, Sugar Alcohols, Sugars, Tagetes Oil, Tannic Acid, Tartaric Acid, Tea Leaf and Absolute, alpha-Terpineol, Terpinolene, Terpinyl Acetate, 5,6,7,8-Tetrahydroquinoxaline, 1,5,5,9-Tetramethyl-13-Oxatricyclo(8.3.0.0(4,9))Tridecane, 2,3,4,5, and 3,4,5,6-Tetramethylethyl-Cyclohexanone, 2,3,5,6-Tetramethylpyrazine, Thiamine Hydrochloride, Thiazole, 1-Threonine, Thyme Oil, White and Red, Thymol, Tobacco Extracts, Tochopherols (mixed), Tolu Balsam Gum and Extract, Tolualdehydes, para-Tolyl 3-Methylbutyrate, para-Tolyl Acetaldehyde, para-Tolyl Acetate, para-Tolyl Isobutyrate, para-Tolyl Phenylacetate, Triacetin, 2-Tridecanone, 2-Tridecenal, Triethyl Citrate, 3,5,5-Trimethyl -1-Hexanol, para,alpha,alpha-Trimethylbenzyl Alcohol, 4-(2,6,6-Trimethylcyclohex-1-Enyl)But-2-En-4-One, 2,6,6-Trimethylcyclohex-2-Ene-1,4-Dione, 2,6,6-Trimethylcyclohexa-1,3-Dienyl Methan, 4-(2,6,6-Trimethylcyclohexa-1,3-Dienyl)But-2-En-4-One, 2,2,6-Trimethylcyclohexanone, 2,3,5-Trimethylpyrazine, 1-Tyrosine, delta-Undercalactone, gamma-Undecalactone, Undecanal, 2-Undecanone, 1, 0-Undecenal, Urea, Valencene, Valeraldehyde,Valerian Root Extract, Oil and Powder, Valeric Acid, gamma-Valerolactone, Valine, Vanilla Extract And Oleoresin, Vanillin, Veratraldehyde, Vetiver Oil, Vinegar, Violet Leaf Absolute, Walnut Hull Extract, Water, Wheat Extract And Flour, Wild Cherry Bark Extract, Wine and Wine Sherry, Xanthan Gum, 3,4-Xylenol, Yeast

Noted throat specialists report on 30-day test of Camel smokers . . .

NOT ONE SINGLE CASE OF THROAT IRRITATION *due to smoking* CAMELS!



Yes, these were the findings of noted throat specialists after a total of 2,470 weekly examinations of the throats of hundreds of men and women who smoked Camels—and only Camels—for 30 consecutive days.

ELANA O'BRIAN, real estate broker, one of the hundreds of people from coast to coast who made the 30-Day Test of Camel Mildness under the observation of noted throat specialists.

. . . AND THOUSANDS MORE AGREE!

"**CAMELS AGREE** with my throat—and they sure taste great!" says Ed Parrin, chemical engineer, who made the Camel 30-day test under a throat specialist.

EDITORIAL ASSISTANT Virginia Welcome: "I didn't believe any cigarette could smoke so mild. But Camels met the test—they certainly agree with my throat!"

"**I'M A VETERAN** when it comes to smoking Camels. They gave me the kind of smoke I like—lots of flavor and plenty mild!" Michael Douglas, singer.

MISS LEE TELLER, secretary: "I'm delighted that I made the 30-day mildness test. It introduced me to the cigarette that really agrees with my throat—Camels."

"**THE 30-DAY TEST** was a real education. It taught me that there's no cigarette quite like a Camel!" Ted Lyons, air travel agency owner.

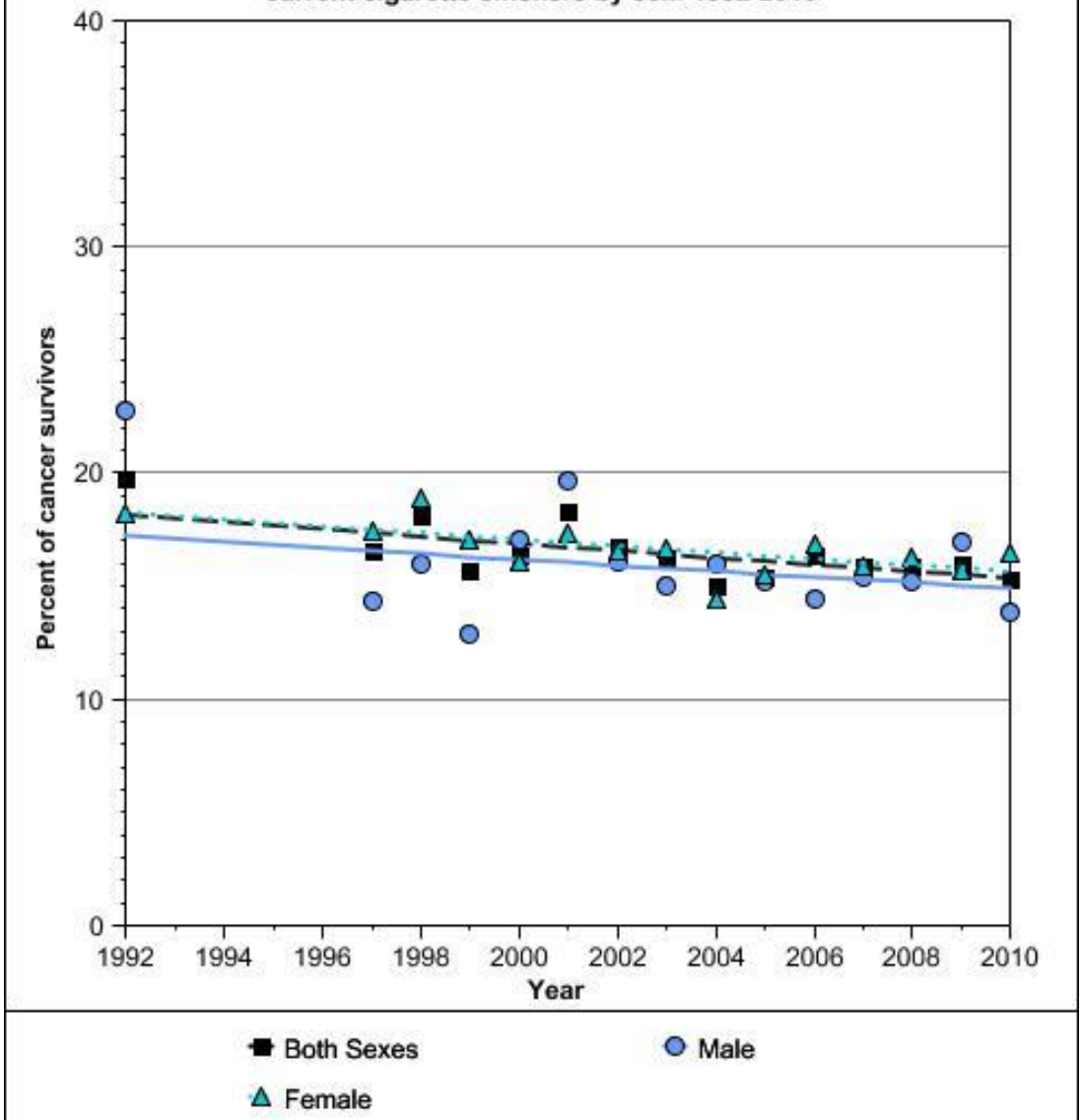
SPORTSWOMAN Joan French: "I like to make my own tests: I smoked Camels for 30 days. They rated so good, I've changed to Camels for keeps!"

Start your own 30-Day Camel MILDNESS Test Today!

It's fun—it's enlightening! All you do is smoke Camels, and only Camels, for 30 days. Compare them in your "T-Zone" (T for taste, T for throat). See if that rich, full Camel flavor and that cool, cool Camel mildness doesn't win you to Camels for keeps.

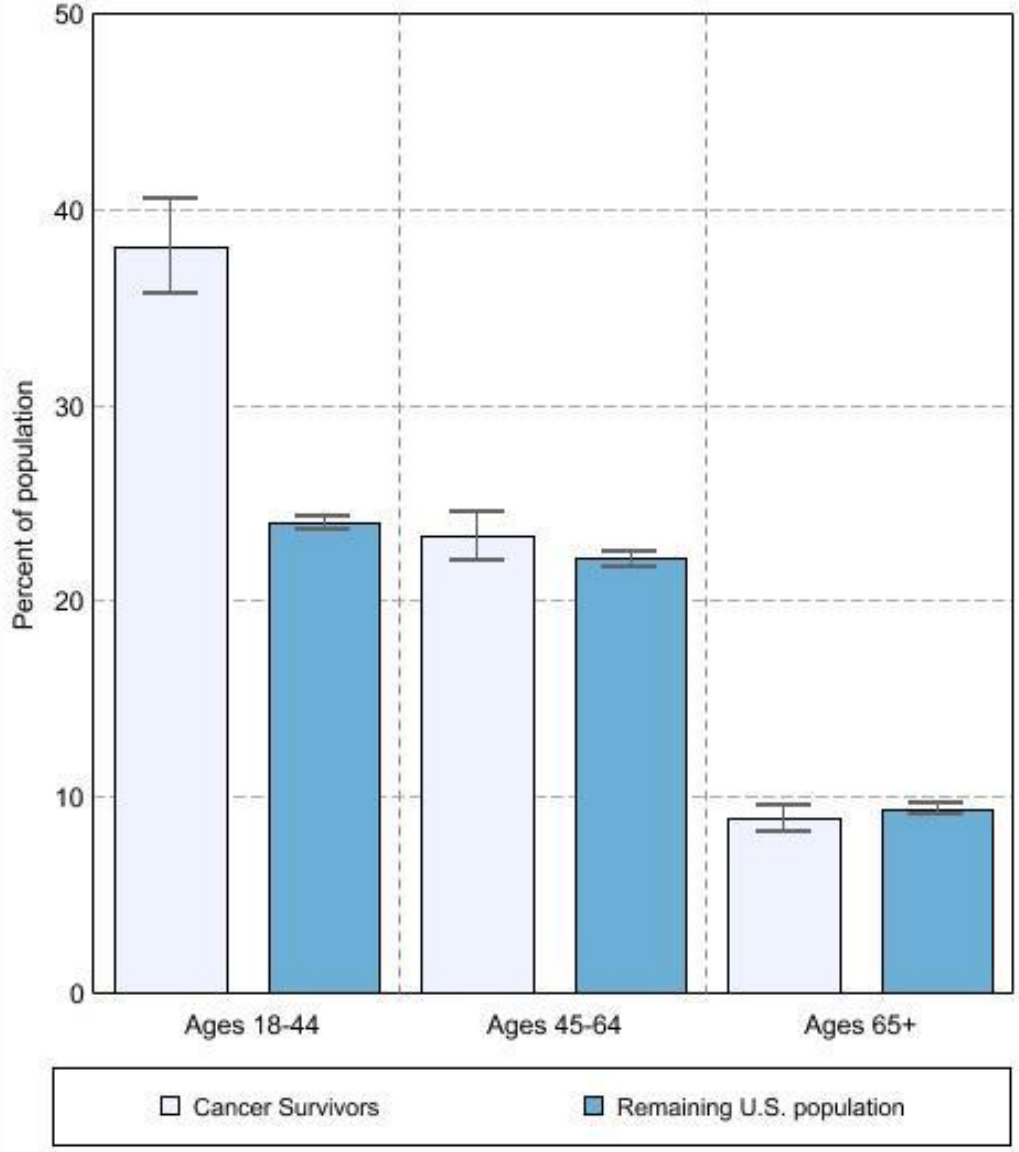
R. J. Reynolds Tobacco Co., Winston-Salem, N. C.

Figure LCS1: Percentage of cancer survivors aged 18 years and older who were current cigarette smokers by sex: 1992-2010



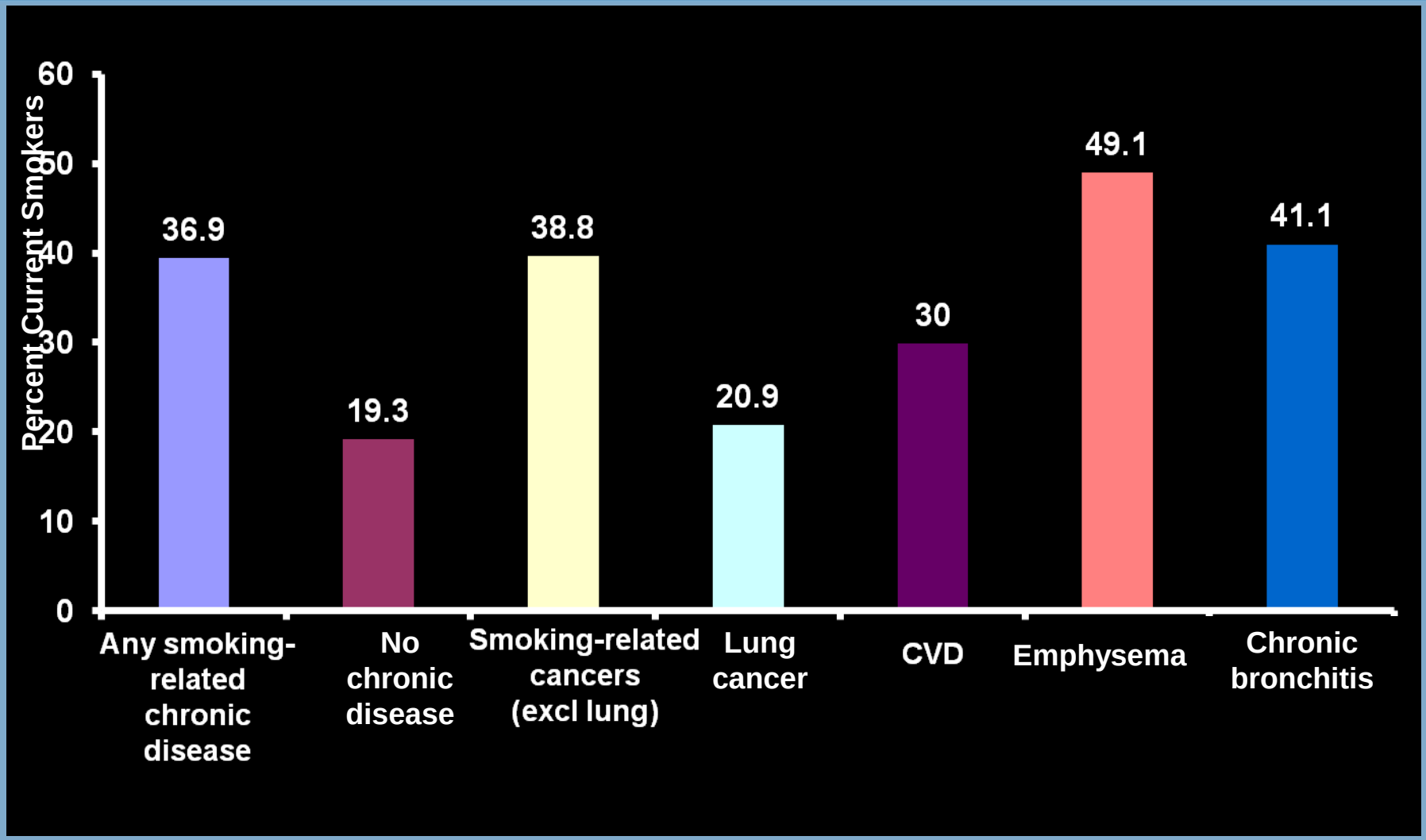
Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey.
Data are age-adjusted based on the age distribution of cancer patients diagnosed in 2000 in the SEER 17 areas (http://seer.cancer.gov/registries/terms.html) using age groups: 18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85+.

Figure LCS2: Percentage of current smokers among cancer survivors and remaining U.S. population by age : 2000-2010



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey.
Data are age-adjusted to the 2000 standard using age groups: 18-24, 25-34, 35-44, 45-64, 65+. Analysis uses the 2000 Standard Population.

Current Smoking Among Chronic Disease Populations – NHIS, 2006



MMWR, 56:1157-1161, 11/09/07

Adverse Effects of Continued Smoking on Treatment Outcomes for Cancer

Surgery

- Increased complications from general anesthesia
- Increased risk of severe pulmonary complications
- Detrimental effects on wound healing
  - Compromised capillary blood flow
  - Increased vasoconstriction
  - Increased risk of wound infection

Radiation

- Reduced treatment efficacy
- Increased toxicity and side effects
  - Xerostomia, oral mucositis, loss of taste, pneumonitis, soft tissue and bone necrosis, poor voice quality

Chemotherapy

- Potential exacerbation of side effects: immune suppression, weight loss, fatigue, pulmonary and cardiac toxicity
- Exacerbation of drug toxicity
- Increased incidence of infection

Gritz ER, Fingeret MC, Vidrine DJ. Tobacco Control in the Oncology Setting. *In*: Cancer Prevention. An ASCO Curriculum, Chapter 4, 2007

Benefits of Smoking Cessation Following Cancer Diagnosis

- **Decreased risk of treatment complications**
- **Decreased risk of second primary tumors**
- **Improved survival rates**
- **Improved quality of life**
- **Greater treatment efficacy???**

Variables that Can Influence Beneficial Effects

- Duration and intensity of smoking history
- Timing of smoking cessation relative to diagnosis and treatment

Gritz ER, Fingeret MC, Vidrine DJ. Tobacco Control in the Oncology Setting. *In*: Cancer Prevention. An ASCO Curriculum, Chapter 4, 2007

Lung and Head/Neck Outcomes

Study	Population	Outcome (Smokers)
Rades *IJROBP* 71: 1134, 2008	NSCLC, 181 pts, RT +/- chemo	Decreased LRC
Tammemagi *Chest* 125: 27, 2004	Lung, 1155 pts.	Decreased survival
Hinds *J Nat Ca Inst* 68: 395, 1982	Lung, 223 women	Decreased 1-yr survival
Johnston-Early *JAMA* 244: 2175, 1980	SCLC, 112 pts, chemo +/- RT	Decreased survival
Stevens *Arch Oto* 109: 746, 1983	H/N, 269 pts.	Inc recurrence (75% less), dec survival
Rugg *Br J Radiol* 63: 554, 1990	H/N, 41 CHART pts.	Increased mucositis
Risch *Am J Epidem* 138: 281, 1993	Lung, 845 pts.	Women sm with higher risk vs. male sm
Phillips *Cancer* 56: 2789, 1985	Smokers, lung, 68 pts.	Decreased NK activity
Garces *Chest* 126: 1733, 2004	NSCLC, 1506 pts.	Decreased QOL
Pytinia *J Clin Oncol* 22: 3981, 2004	H/N, 100 pts.	Decreased OS, RFS, DFS
Marin *Plast Recon Surg* 121: 451, 2008	H/N, 89 pts, flap recon	Poor wound healing (cor with cotinine)
Videtic *J Clin Oncol* 21: 1544, 2003	SCLC, 189 pts., chemo/RT	Decreased MS and 5-yr OS
Marshak *IJROBP* 43: 1009, 1999	Glottic larynx, 207 pts., RT	Decreased LRC (UV)
Fox *Lung Cancer* 44: 237, 2004	NSCLC, 237 pts, RT +/- chemo	Decreased MS and 2-yr survival (early stg)

Prostate Outcomes

Study	Population	Outcome (Smokers)
Alsadius *Radiother Oncol*, 2011	834 prostate, tx with RT	Increased urgency, cramps, diarrhea
Kenfield *JAMA* 305:2548, 2011	Prospective 5366 prostate (Health Prof Follow-up Study)	Current increased overall, prostate, CVD mortality, reversed with 10+ yr cessation
Joshu *JNCI* 103:835, 2011	1416 prostatectomy	Current increase recurrence, cess by 1 yr post diagnosis with no increased risk
Chen *J Chin Med Assoc* 74:69, 2011	89 radiation enterocolitis pts	Increased need for surgery
Taira *IJROBP* 79:1336, 2011	1656 RT/brachy pts +/ADT	Decrease OS (HR 2.9 curr, 1.4 former)
Ku *Can Urol Assoc J* 3:445, 2009	213 prostatectomy	Decreased QOL
Weinmann *Ca Caus Cont* 21:117, 2010	768 who died of prostate CA (Pros Ca Scr Mort Study)	Most recent smoking status most important predictor for prostate cancer death
Watters *CEBP* 18:2427, 2009	283312 men	Increased fatal prostate cancer (HR 1.7)
Huncharek *Am J Pub Hth* 100:693, 2010	24 cohort review	Increased prostate cancer and fatal PC
Shiels *Ca Caus Cont* 20:877, 2009	1275 non-cancer (NHANES III)	Increased serum+free testosterone
Simone *J Urol* 180:2447, 2008	5070 prostatectom (CaPSURE)	Increase non-prostate mortality
Bittner *IJROBP* 72:433, 2008	1354 brachy +/- ADT	Increased CVD and non-prostate mort
Boorjian *J Urol* 177:883, 2007	9780 prostate (CaPSURE)	Increased bladder CA esp. current sm+RT
Carlos *J Am Coll Surg* 200:216, 2005	22094 non-cancer men	Decreased CRC and prostate screening

Breast Outcomes

Study	Population	Outcome (Smokers)
Angarita *J Hosp Infect* 79:328, 2011	199 breast cancer	Increased postop infection
Zaman *Ann Oncol* 2011	261 tam/let breast (BIG 1-98)	Decreased bone mineral density
Land *Ca Prev Res* 4:1393, 2011	NSABP P-1 (prevention)	Decreased adherence to tamoxifen
Hellmann *Eur J Ca Prev* 19:366, 2010	528 breast (Copen Ht St)	Increased mortality
Baumann *Plas Rec Surg* 125:1335, 2010	228 br recon, prosp (MDACC)	Increased fat necrosis
Dragun *Cancer* 117:2590, 2011	11914 Tumor registry	Decreased OS
Cowen *Br Ca Res Treat* 121:627, 2010	141 postop recon, (prospective)	Increased implant failure
Li *J Clin Oncol* 27:5312, 2009	1089 unilateral ER+ breast	Increased contralateral breast CA
Stefan *J Neurooncol* 94:221, 2009	1274 stroke unit pts (+/- Ca)	Increased thrombosis, similar stroke risk as in non-cancer patients
Wadhwa *Br Ca Res Treat* 117:357, 2009	152 traztuzumab pts	Increased cardiomyopathy risk (~5 fold)
Dal Maso *Int J Cancer* 123:2188, 2008	1453 breast	Increased OM and DSM
McCarthy *Plas Rec Surg* 121:1886, 2008	1170 breast, surgery (MSK)	Increased complications and recon failure
Sagiv *JNCI* 99:365, 2007	1273 breast with post dx assess	Increased OM and DSM
Jagsi *Cancer* 109:650, 2007	828 breast, sx+RT	Increased MI and MI req intervention
Sorenson *Eur J Surg Oncol* 28:815, 2002	415 mastectomy (prospective)	Increased infection, necrosis, epidermolysis

Smoking at Diagnosis and Survival

Analysis Type	Current vs. Former	Current vs. Never
Overall Mortality (Cox Prop HR)	1.29 (95% CI 1.17-1.29)	1.38 (95% CI 1.23-1.54)
Disease Spec. Mortality (Cox Prop HR)	1.23 (95% CI 1.09-1.39)	1.18 (95% CI 1.03-1.36)
3-year Overall Mortality (Log Reg)	1.50 (95% CI 1.19-1.89)	1.45 (95% CI 1.14-1.85)
3-year Disease Spec. Mortality (Log Reg)	1.57 (95% CI 1.22-2.01)	1.43 (95% CI 1.10-1.84)

Adjusted for disease site, gender, age, stage, race, diagnosis date, body mass index, and pack year smoking history

Warren GW, Kasza KA, Reid ME, Cummings KM, Marshall JR. *Int J Cancer*, 132(2):401-410, 2013

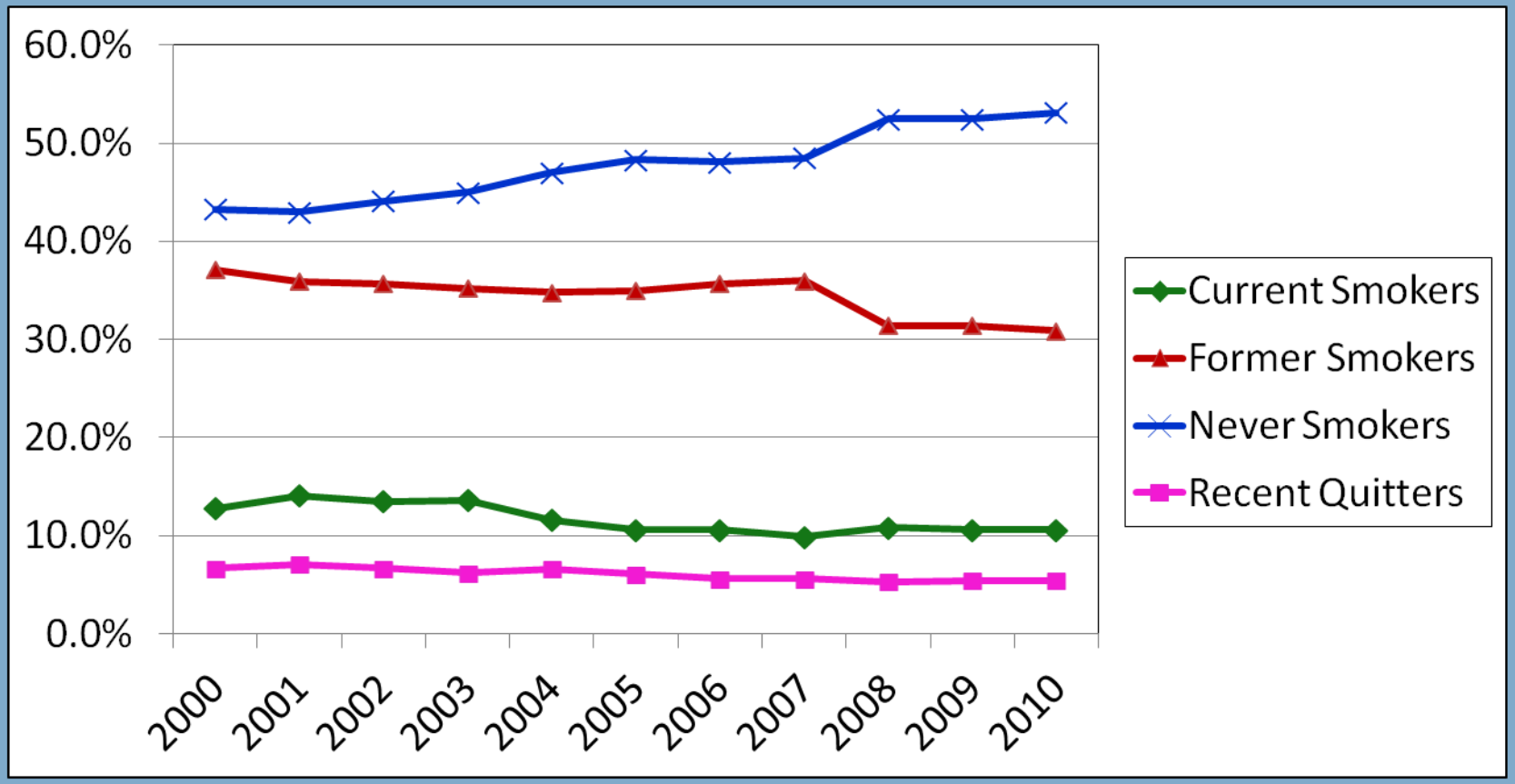
Smoking Status at MD Anderson Cancer Center

Smoking Status – Definitions
Patient History Database (PHDB), MD Anderson Cancer Center

- **Self-reported clinical intake assessment questionnaire completed by all newly registered patients.**
- **Approximately 93% of all newly registered patients completed the questionnaire.**
- **Smoking status is categorized as follows: current, recent quitter (quit less than 1 year prior to presentation to MDA), former (quit longer than 1 year prior to presentation to MDA) and never smokers.**

MD Anderson Cancer Center Patient History Database, supported by the Tobacco Settlement Funds, 2007, unpublished

Smoking Status of Cancer Patients 2000-2010 MD Anderson Cancer Center



Patient History Database, unpublished data

Note: ~ 45% of MDACC patients ³ 60 yrs

Accuracy of Self-Reported Tobacco Assessments in a Head and Neck Cancer Treatment Population

- **N=50 head and neck cancer patients.**
- **Prospective analysis – self-reported and biochemically confirmed (serum cotinine) tobacco use during treatment (baseline and weekly → week 7): 93% compliance.**
- **29.4% patients misrepresented smoking status according to cotinine levels**
- **Accuracy increased by 14% with weekly vs. baseline self-report.**

Warren GW, Arnold SM, Valentino JP, Gal TJ, Hyland AJ, Singh AK, Rangnekar VM, Cummings KM, Marshall JR, Kudrimoti MR. *Radiotherapy and Oncology*, 103: 45-48, 2012

Smoking and Tobacco Use are Important to Address in the Oncology Setting

- **Rates of current smoking at diagnosis among patients with lung or H&N tumors are 40-60%.**
- **Initial high quit rates following surgery decline over time: 36.9% of patients were smoking 1 year after surgery for non-small cell lung cancer (NSCLC).**
- **Patients with cancers less strongly associated with smoking have lower long-term quit rates.**
- **Overall, up to 30-50% of patients smoking at diagnosis do not quit, or relapse following initial quit attempts.**
- **Relapse even occurs among patients who quit ≥ 1 year earlier**

Walker MS, Vidrine DJ, Gritz ER, Larsen RJ, Yan Y, Govidan R, Fisher EB. *CEBP*, 15:2370-77, 2006;
Cooley ME, Sarna L, Kotlerman J, Lukanich JM, Jaklitsch M, Green SB, Bueno R. *Lung Cancer*, 66:218-225, 2009;
Gritz ER, Lam CY, Vidrine DJ, Fingeret MC. *In*: Cancer: Principles and Practices in Oncology, Chapter 51, pp 529-542, 2011

Tailoring Smoking Cessation Interventions to Patients with Cancer

- **Education about the link between cancer and smoking.**
- **Sensitivity to physical limitations imposed by disease and treatment (especially pertaining to diet and exercise).**
- **Medical contraindications to certain types of pharmacologic treatment must be recognized and appropriately managed.**
- **Psychological issues such as guilt, depression, anxiety, and stress should be considered and addressed.**
- **Recognition of delayed relapse.**

Gritz ER, Fingeret MC, Vidrine DJ, Lazev AB, Mehta NV, Reece GP. *Cancer,* 106:17-27, 2006

National Cancer Institute Conference on Treating Tobacco Dependence at Cancer Centers

By Glen Morgan, PhD, Robert A. Schnoll, PhD, Catherine M. Alfano, PhD, Sarah E. Evans, PhD, Adam Goldstein, MD, MPH, Jamie Ostroff, PhD, Elyse Richelle Park, PhD, Linda Sarna, DNSc, RN, and Lisa Sanderson Cox, PhD

Tobacco Control Research Branch and Office of Cancer Survivorship, National Cancer Institute; Bethesda, MD; Department of Psychiatry, University of Pennsylvania, Philadelphia, PA; Department of Family Medicine, University of North Carolina, Chapel Hill, Chapel Hill, NC; Behavioral Science Service, Memorial Sloan-Kettering Cancer Center, New York, NY; Department of Psychiatry and Health Policy, Harvard Medical School, Boston, MA; School of Nursing, University of California, Los Angeles, Los Angeles, CA; Department of Preventive Medicine and Public Health, University of Kansas Medical Center, Kansas City, KS

Morgan G, Schnoll RA, Alfano CM, Evans SE, Goldstein A, Ostroff J, Park ER, Sarna L, Cox, LS. *J Oncology Practice*, 7: 178-182, 2011

National Cancer Institute Conference on Treating Tobacco Dependence at Cancer Centers
December 2009

- **Highlighted the importance of treating tobacco dependence in the context of cancer care and survivorship.**
- **Reviewed guidelines for treating tobacco dependence in cancer patients and cancer survivors.**
- **Discussed models for tobacco dependence treatment in the oncologic context.**
- **Discussed barriers to the implementation of tobacco dependence treatment in cancer centers.**
- **Reviewed strategies to overcome barriers.**
- **Explore scientific questions related to tobacco dependence treatment that require further study.**

Morgan G, Schnoll RA, Alfano CM, Evans SE, Goldstein A, Ostroff J, Park ER, Sarna L, Cox, LS. *J Oncology Practice*, 7: 178-182, 2011

National Cancer Institute Conference on Treating Tobacco Dependence at Cancer Centers December 2009

- **Survey of 58 NCI cancer centers – 60% offer some form of tobacco use treatment (often limited to disease sub-populations); <50% have designated personnel; availability of tobacco use treatment programs lags behind other models of care (e.g., nutrition). Resource needs – motivation and commitment of oncology leadership, funding, personnel.**
- **Priorities to enhance quality of care for tobacco dependence:**
  - **Develop consensus regarding assessment of smoking status**
  - **Refine EMRs and clinical trials to ensure identification and referral of smokers**
  - **Evaluate novel treatment of cancer patients**
  - **Evaluate methods to overcome barriers to providing treatment**

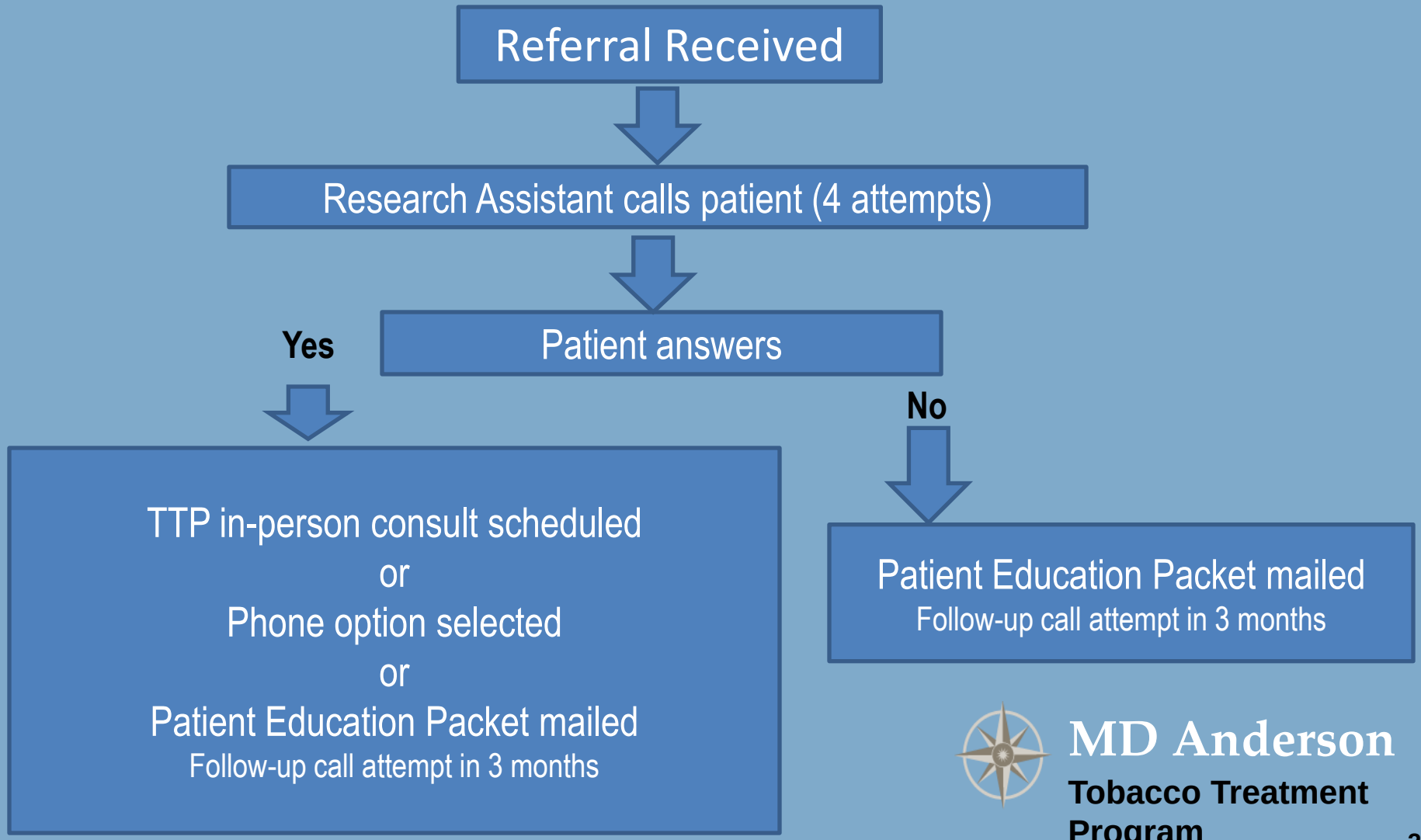
Morgan G, Schnoll RA, Alfano CM, Evans SE, Goldstein A, Ostroff J, Park ER, Sarna L, Cox, LS. *J Oncology Practice*, 7: 78-182, 2011
Goldstein AO, Ripley-Moffitt CE, Pathman DE, Patsakham KM. *Nicotine & Tobacco Research*, 15:52-58, 2013

MD Anderson
Tobacco Treatment Program

A comprehensive tobacco-cessation and relapse prevention program for all MD Anderson Cancer Center patients and employees

- **In-person and/or telephone behavioral counseling**
- **Prescription medications & nicotine replacement**
- **Multidisciplinary team (psychologists, psychiatrist, social workers, PA, nurse)**
- **Assessment and treatment of comorbid psychiatric disorders, depressive/anxiety symptoms, substance use and abuse**
- **No charge**

TTP Referral Processing – Service Offerings



MD Anderson
Tobacco Treatment Program

TTP Referral Sources – FY13*

Source	Referrals	TTP	Educational Packets Only	Educational Packet & Program Call
Health Care Provider	444	138 (31%)	91 (20%)	215 (48%)
Self	76	45 (59%)	6 (8%)	25 (33%)
AER[1] based on EHR	2883	201 (7%)	731 (25%)	1951 (68%)

[1] Automatic Electronic Referral

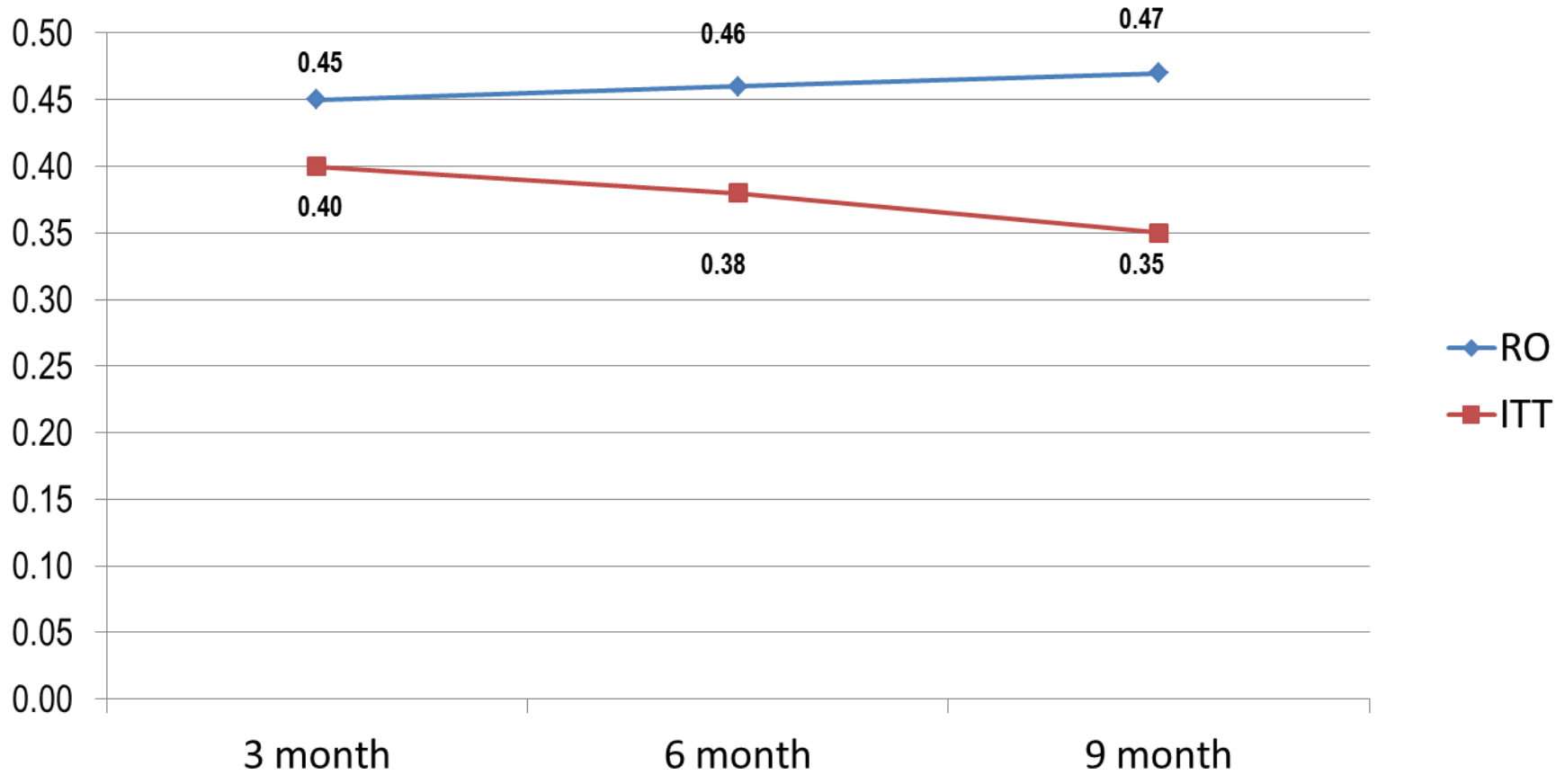
- Patients can be referred by more that one source.
- In that case, only one source is credited in the following order of precedence; Health Care Provider, Self, AER based on EHR.

  Patient counts are unique within source, and across sources.

* September 1, 2012 – April 30, 2013

MD Anderson
Tobacco Treatment Program

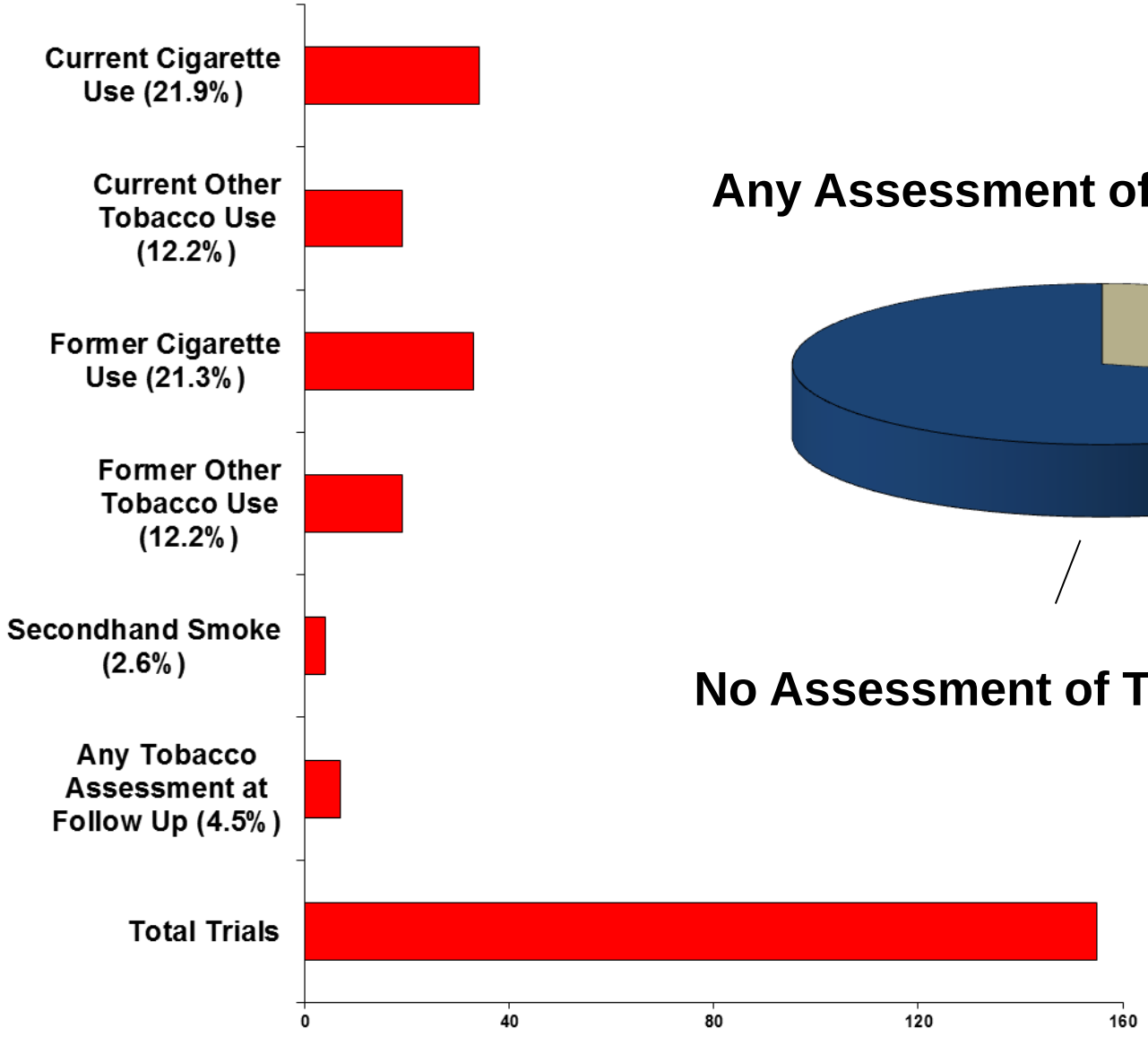
Cessation Rates by Contact Status over Time:
Intent-to-Treat (ITT) & Respondent-Only (RO)
2006-2012



EOT = 3 months
ITT – N = 2564 – non-responders are assumed to be smoking
RO – non-responders are dropped from analyses
N at 3 month = 2291; N at 6 month = 2093; N at 1899

MD Anderson
Tobacco Treatment Program

Assessing Tobacco in Cooperative Groups



Peters EN, Torres E, Toll BA, Cummings KM, Gritz ER, Hyland A, Herbst RS, Marshall JR, Warren GW, *J Clin Oncol* 30:2869-2875, 2012

Tobacco Assessment in Actively Accruing National Cancer Institute Cooperative Group Program Clinical Trials

Conclusions

- **Most actively accruing cooperative group clinical trials do not assess tobacco use.**
- **No trials assess nicotine dependence or interest in quitting during enrollment or follow-up.**
- **Failure to incorporate standardized tobacco assessments will limit the ability to provide evidence-based cessation support and will limit the ability to accurately understand the precise effect of tobacco use on cancer treatment outcomes**

Peters EN, Torres E, Toll BA, Cummings KM, Gritz ER, Hyland A, Herbst RS, Marshall JR, Warren GW, *J Clin Oncol* 30:2869-2875, 2012

International Association for the Study of Lung Cancer (IASLC) Survey

Practice Patterns and Perceptions of Thoracic Oncology Providers on Tobacco Use and Cessation in Cancer Patients

- **Tobacco use is associated with poor outcomes in cancer patients, but there is little information from oncology providers on their practice patterns or perceptions regarding tobacco use and smoking cessation in these patients**
- **Online survey of 1,507 members of IASLC (40.5%)**
- **Results:**
  - **90% believe smoking affects outcome & cessation should be part of clinical care**
  - **90% Ask about tobacco use; 81% Advise to quit; 79% Assess intention to quit, but only**
  - **39% Assist with cessation or refer (Arrange)**
  - **48% Lack of training experience**
- **Conclusions: Increasing tobacco cessation activities by thoracic oncology providers will require:**
  - **↑ assessment & cessation at diagnosis and during follow-up**
  - **↑ clinician education, and improved tobacco cessation methods**

Warren GW, Marshall JR, Cummings KM, Toll B, Gritz ER, Hutson A, Dibaj S, Herbst R, Dresler C, *J Thoracic Oncol*, 8:543-548, 2013

AACR Policy

- **Statement calls for greater efforts in smoking cessation in oncology patients and survivors**
- **Tobacco use should be evaluated as a confounding factor in oncology clinical trials**
- **Surveys show tobacco use is often not measured in oncology trials and care**

Toll BA, Brandon TH, Gritz ER, Warren GW, Herbst; Writing Committee for the AACR Subcommittee on Tobacco and Cancer, *Clin Cancer Res*, 19:1-8, 2013

Tobacco-Free Cancer Patients

Ellen's Orchids