

PACK-YEARS (PY)

An (Easy) Enhancement of Cigarette Use Underwriting

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Underwriting tobacco use – cigarette smoking in particular – has presented unique problems for underwriters since its inception in the late 1970s.

It is unlikely that there has been any significant decrease in the prevalence of everything from well-intentioned appeals to unabashed finagling on the part of producers and their clients over both genuine and feigned issues where tobacco use underwriting practices are concerned.

Thus, any steps we can take to optimize the appropriateness of how we assess insurability related to cigarette smoking will serve us well, in terms of underwriting outcomes as well as credibility with customers and those who generate the business that keeps us employed!

The Problem

From day one, our intention has been to treat insurance seekers in an equitable manner as regards their tobacco use proclivities. Toward this end, we have insisted (save for a few outliers trolling for fringe business) that smoking one cigarette within anywhere from 12 to 60 months of the application date disqualifies the proposed insured from qualifying for “non-user” status in one product/class context or another.

In the same vein, we confer “non-user” status on those who have wholly refrained from puffing away for equivalent intervals.

This approach is flawed because it is based on the premise that current smoking *per se* confers risk independent of both volume of consumption and duration of use...

...a notion which flies in the face of pervasive evidence that the vast majority of cigarette-mediated excess mortality and morbidity is driven by cumulative exposure for extended intervals of time.

Indeed, our current practices might well put us at risk for being perceived with incredulity, as these two examples demonstrate:

Applicant A is a 56 year-old man who smoked for 2 years in late adolescence, quit when he went off to college and only recently took up the habit in the wake of his wife's death after a long, gut-wrenching and (thanks to prevailing mediocre health insurance coverage) resource-decimating battle against the disease.

During these many months, our proposed insured functioned in a physically and emotionally exhaustive caregiver role and he has only recently recovered from his grief. This realities notwithstanding, the fact remains that he is now smoking a few cigarettes each day, with the intention of getting back "on the wagon" (i.e., quitting now that he no longer needed this "crutch").

Because he is a current smoker, he must pay "user" rates because of the "excess risk" conferred by a grand total of 3 years of smoking of over 56 years of living.

Applicant B is also 56. He also started smoking in late adolescence – age 17 to be precise – and continued at a rate of 40 cigarettes/day until age 50...when, we allow ourselves to fantasize...he *magically* came to appreciate how residing in Marlboro Country was nothing short of handing over control of his life to a (suddenly-recognized) "filthy habit".

Because he has not sneaked a single butt for 6 years, he qualifies for non-user status by even the most stringent of known criteria.

What's wrong with this picture?

In addition not inquiring as to the reason for Applicant B's dramatic "about face" after 33 years, we have looked away from the cold, hard and lethal reality that during his active cigarette narcosis, he accumulated roughly 66 pack-years of tissue damage...

...damage which, in the main, cannot be undone and thus puts him at insidious on-going risk for a wide range of ominous health consequences.

Meanwhile, Applicant A, despite accruing no significant risk from his aggregate cigarette exposure, is condemned to pay higher insurance premiums.

In both cases, our practices collide headlong with medical reality and common sense.

The Solution

Given our reliance on cotinine testing as the final arbiter of "user" status, it is difficult to modify our approach to Applicant A...lest we open the floodgates!

Therefore, he will have to pay dearly for his relapse to smoking, albeit in the certain knowledge that quitting...and staying quit...will restore him to “non-user” status in due course.

A reasonable approach to Applicant B is more readily realized.

How?

By rightly declaring him to be, in effect, a “permanent user” based on his cumulative exposure, as defined by the pack-years he has relentlessly accumulated.

No matter how long he remains “cigarette-free”, the damage is done and the extent of that damage rightly disqualifies him from residing the same risk pool as lifetime non-users and those who quit in a timelier manner.

To accomplish this just end, we must embrace pack-years as a risk criterion in cigarette smokers.

One pack-year is defined as smoking one pack of cigarettes per day for 12 months. Thus, by virtue of Applicant B’s 2-pack-per-day habit he acquired 2 pack-years in one calendar year and finished his coffin-nail odyssey with 66 PY at a point where either symptoms (probably) or insight (improbably) caused him to give up smoking.

To derive valid pack-year information, we need ask only two additional questions of those who admit to ever having smoked cigarettes:

1. “When did you start?”...or, if you prefer...”How many years have you been smoking?”
2. “On average, how much do/did you smoke per day?”

Let the record show that these are essentially the same questions clinicians raise routinely with new patients.

You may argue that people change their pattern of consumption, such as going from 2 packs per day to 1 or less.

Indeed, they do...but evidence shows that the overarching unconscious goal is attaining a sufficient dose of nicotine to assuage their dependency state. Therefore, in the end, their exposure to the toxic ingredients in cigarette smoke remains more or less the same by virtue of changing their intensity of smoking each cigarette, etc.

Another hypothetical argument against deploying pack-year underwriting is that, by pronouncing a longtime heavy smoker a “permanent user”, we will somehow undermine his incentive to quit and thus become *part of the problem* where our (oft-spoken yet absurdly unattainable) goal of a “smokeless society” is concerned.

It is not the function of insurers to subordinate appropriate risk assessment practices to matters such as this.

More to the point, it is manifestly unfair to permanently rate (for disease duration) a well-controlled, treatment-compliant type 2 diabetic for the imputed late consequences of years of prior dysregulation of glucose metabolism while paving the road to “non-user super preferred” for ex-smokers whose residual risks equal or exceed those of this diabetic.

In order to use pack-years, all we need is:

- Credible evidence of their impact on risk
- The will to do the right thing

Synthesizing will is beyond the scope of this essay.

Evidence, on the other hand, is abundant...

The Evidence

In the Seven Countries Study, investigators measured smoking habits at baseline in 12,763 American, European and Japanese males, ages 40 to 59, to assess 25-year mortality outcomes. [Jacobs]

All-cause mortality increased significantly with duration of smoking and was significantly higher in those who smoked 10 or more cigarettes per day as compared to consuming 9 or fewer each day. It took 10 years of abstinence before ex-smokers reached “almost” the same level of risk as never-smokers and these findings were not – unfortunately – further fractionated by extent of prior exposure in quitters.

In the Norwegian Counties Study, almost 50,000 subjects born between 1925 and 1941 were followed to attained ages of 40 to 70 years old. [Vollset]

All-cause mortality was 34% higher in women who smoked ≥ 20 cigarettes/day as compared to those using 10-19. The risk rose proportionally in men as consumption levels increased from 1-9 to 10-19, ≥ 20 and ≥ 25 .

By attained age 60-69, men who quit in their 50's had 50% greater death risk than men who had discontinued cigarettes in their 40's. The same results were reported in females.

In the Cardiovascular Health Study, 5-year prospective mortality in subjects age 65 and over at baseline was sorted by pack-years. [Fried]

Pack-years	Relative Mortality Risk
Never-smoked	1.00
1 – 25	1.10
26 – 50	1.13
> 50	1.58

In a 9-year prospective study of 17,748 postmenopausal women, multivariate-adjusted mortality was fractionated by smoking history (which, considering the gender, we will assume was almost entirely cigarettes). [Tice]

Smoking History	Relative Mortality Risk
Never	1.00
Past - < 50 PY	1.20
Past - ≥ 50 PY	2.00
Current - < 50 PY	2.20
Current - ≥ 50 PY	3.70

You will notice that 9-year prospective mortality was virtually identical in quitters accumulating 50+ pack-years as it was in current smokers with ≤ 50 PY...and far greater than past smokers who consumption peaked at < 50 PY.

In a French study of 9758 asymptomatic middle-aged men followed prospectively to assess the risks of future cardiac disease, the researchers reported the risk of acute coronary syndrome events based on cigarette use status. [Canoui-Poitrine]

	ACS Risk Adjusted Hazard Ratio
Nonsmokers	1.00
< 20 Lifetime PY	1.26
≥ 20 Lifetime PY	2.07

In a review paper on cigarette smoking and cancer risk, the authors made this observation:

“Previous analysis...identified a linear relationship for pack-years of smoking and lung cancer risk, with a distinct pattern for the effects of smoking intensity. Our

analysis of additional studies of lung cancer and cancers of the bladder, oral cavity, pancreas and esophagus suggests that this relation is broadly consistent across diverse cancer sites.”

Jay H. Lubin, et al
 National Cancer Institute
 American Journal of Epidemiology
 166(2007):479

Taiwanese physicians studying genetic factors in lung cancer risk reported data on the association between risk of bronchogenic carcinoma and lifetime cigarette PY exposure (whether currently or previously smoking). [Chang]

Odds Ratio

Never Smoker	1.0
< 40 PY	1.8
≥ 40 PY	7.4

In a study of 1514 bladder cancer patients, Castelao and coworkers examined both intensity and duration of smoking in terms of the risk of this malignancy:

Males Only

Number of Cigarettes/day	Number of Years of Smoking		
	< 20	20-39	≥ 40
Never-Smokers	1.00	1.00	1.00
< 20 Odds Ratios	1.09	1.52	2.54
20-39 Odds Ratios	1.37	2.72	3.77
≥ 40 Odds Ratios	1.89	4.87	5.23

The differences were even more dramatic in the female subjects.

An investigation of the association between cigarette smoking and colorectal cancer in the Women’s Health Initiative (146,877) looked at a wide range of cigarette-use parameters related to the risk of invasive disease. [Paskett]

- Women who smoked 25 or more cigarettes per day had a 42% greater risk of colon cancer than those who smoked fewer
- At all durations of smoking beyond 20 years, the risks of both colon and rectum malignancy were increased.
- Subjects who quit smoking at ages 40 and older had higher risks than those quitting at younger ages.
- Durations of less than 20 years since abstaining had higher risks than longer intervals.

A recent examination of the association between pack-years of smoking and cancers of the larynx and pharynx revealed steep increases in risk as exposure increased within subsets of PY. Subjects with at least 45 PY had 3 time's greater risk of laryngeal carcinoma and twice the risk of pharyngeal malignancy as those with 20 to 44 PY. [Applebaum]

Using data from the Atherosclerosis Risk in Communities Study, investigators contrasted non-diabetic subjects across a range of variables by PY of cigarette exposure. In each of these key risk factors, individuals with > 30 PY had significantly less desirable findings than those with fewer PY as well as never-smokers. [Yeh]

- % with < 12 years education – typical of heavy smokers
- Mean waist-to-hip ratio – the best indicator of abdominal obesity
- Mean WBC count – a major marker for inflammation and CVD risk

They also found that “greater cumulative exposure to cigarette smoking predicted development of type 2 diabetes” and that an excess risk of diabetes was still observable as long as 6 years after quitting. Heavy smokers (> 20/day) had 32% greater T2DM risk than lighter smokers.

In an editorial on deep venous thrombosis, a Scottish expert cited data showing that heavy or long-duration cigarette smokers had 3-fold greater DVT risk than either former smokers or all current smokers taken together. [Lowe]

Lastly, on the matter of the merits of asking longtime quitters why they suddenly acquired a distaste for their longtime nicotine delivery device, we offer this comment by Yale University Medical School professor:

“A disproportionate share of smokers with adverse health events quit smoking”

- Patricia S. Keenan, PhD, MHS
Archives of Internal Medicine
169(2009):237

Final Observations

The findings cited here were discovered incidentally while researching other topics. One can only wonder at how much more evidence in support of using pack-years in underwriting awaits discovery by virtue of a thorough literature review!

The time has come to reconfigure our approach to underwriting longtime, heavy cigarette smoking by embracing pack-years. Once we do so, we need to draw an appropriate line beyond which aggregate PY exposure no longer accommodates a return to “non-user” status in those who *finally* walk away from their addiction.

While we make these changes, it would also be timely to consider adding a question to our teleinterviews wherein we ask long-duration smokers why they quit.

Their answers we get could be rather revealing...

... that is, if taken via teleinterviews; acquired via traditional (exam, non-med) modes of history-taking, they would lack verisimilitude!

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