

# Glutathione and Lung Health

## Every Breath You Take

You don't even have to think about it! Every few seconds, your body automatically takes a breath of air which your heart sends on to every cell.

Your lungs are crucial to your survival. You can't go much more than four minutes without air. Only your heart would rank higher when you think of the most vital organs of the body. But that's really kind of a toss-up as your heart has to have the oxygen supplied by the lungs to keep beating.

Heart and lungs: a true team that works together and is vitally dependent upon one another!

Health advisors and doctors are constantly telling us how to support good heart health. But when was the last time you heard anyone worry over lungs?

## Love your lungs!

We think it's time to focus a little attention and care on our hardworking and faithful lungs. And we hope this doesn't come as a surprise: glutathione (GSH) is arguably the most vital, valiant protector of the lungs.

Just think about it. Each breath you take exposes your lungs to pollution, allergens, smog, dust, first- or second-hand cigarette smoke—a lungful of dangerous airborne particles. If any area of the body is under a full-scale attack by free radicals and toxins, it is certainly the lungs.

We probably don't realize the one-two punch our lungs take from this exposure to toxins and free radicals. Not only is there oxidant damage from free radical attacks, but the body's response to cellular injury is inflammation. That's all well and good but the inflammatory process, once triggered, often rages out of control. When that happens, a number of lung ailments and disorders arise.

Thankfully, the epithelial cells that line the lower respiratory tract have a protective screen of

glutathione to protect against oxidant damage by free radicals. In fact, early research showed that total glutathione (both GSH and oxidized GSSG) of normal epithelial lining fluid was **140 times higher** than the glutathione found in the blood of the same person!<sup>1</sup>

Irfan Rahman and William MacNee, researchers from the University of Edinburgh in the UK, stated that **glutathione (GSH) "is emerging as one of the fundamental antioxidant defense mechanisms in oxidant-induced lung injury and inflammation."**<sup>2</sup>

If you are a smoker or are routinely exposed to second-hand smoke, glutathione is **even more vital**. Yes, every lecture given about quitting smoking warns that smoking harms the lungs. But have you heard *exactly* how harmful smoking is?

## Smokers: Are you aware of this?

Rahman and MacNee estimate that **one single puff** of cigarette smoke contains  $10^{14}$  or **1,000,000,000,000,000 free radicals!** They go on to say that "epidemiological evidence leaves no reasonable doubt that cigarette smoke is the major causative agent of COPD [chronic obstructive pulmonary disease], with atmospheric pollution as an additional contributory factor."<sup>3</sup>

A free-radical attack of that enormity would be purely terrifying when you think of the damage that could be done to the lungs. But remember, there is protective glutathione already in place in the lungs. In another study, Rahman observed: "Glutathione (GSH) is a vital intra- and extracellular protective antioxidant in the lungs."<sup>4</sup>

A highly damaging effect of cigarette smoke is that it depletes total glutathione in the airways. Components in smoke cause glutathione to oxidize but not to the normal oxidized form (called GSSG), which the body can recycle back to GSH. Instead, cigarette smoke creates "nonreducible glutathione-aldehyde forms,"

depleting the total available glutathione pool.<sup>5</sup>

This depletion is reason enough to ensure that the body can create new glutathione to replace that lost by smoking. Researchers Rahman and MacNee validate this in the study mentioned previously. They also understand how to increase glutathione. "At present, GSH precursor amino acids are the best means of manipulating GSH biosynthesis intracellularly."<sup>6</sup>

### British Medical Journal Reveals the Best Incentive for Quitting Smoking

It seems it doesn't seem to do much good to tell smokers all the negative consequences of smoking. Surprisingly, what actually **doubled the rate of quitting** was a simple discussion of lung age! A study in the March 15, 2008 issue of the *British Medical Journal* told how showing smokers that

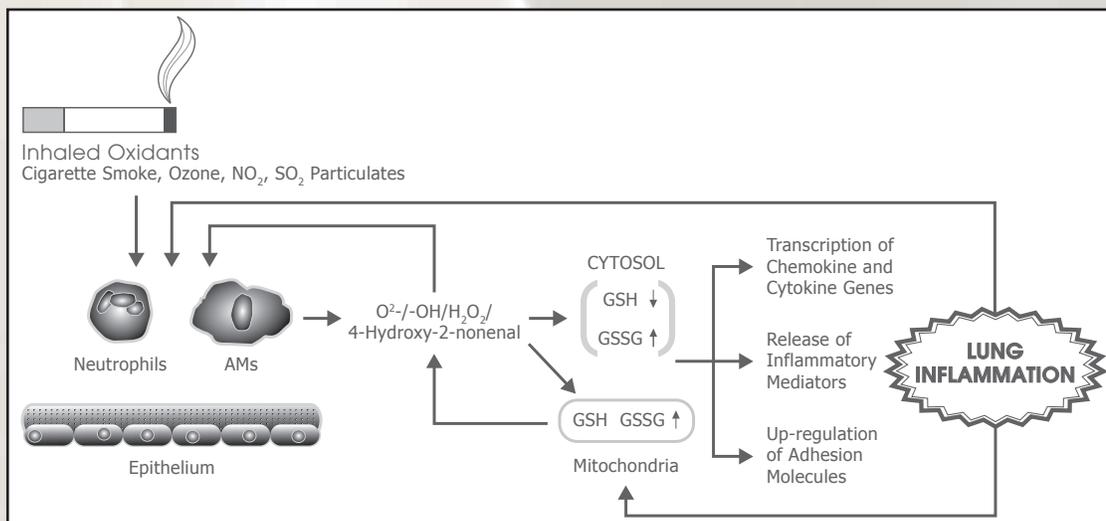
smoking damages the lungs as if they were aging more rapidly than normal, **doubled** the rate of those who stopped smoking.

It seems having a smoker's lung health compared to that of an older person was mighty motivation!<sup>7</sup> Smoker's "old" lungs are one more example of how free radicals truly cause the body to age faster than normal.

We hope this information inspires those who would like to quit smoking!

### Remember the Good News!

Don't be discouraged about the beating your lungs take every day. You may not be able to control all the pollutants in the air you breathe. But you *can* protect and preserve your lungs with the mighty antioxidant glutathione!



Mechanisms of oxidant-mediated lung inflammation

#### References

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