

# Lesson 14

Pancreatic Cancer – A Full Overview



# Video 2 Supplement

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# About

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**Why This  
Topic?**

# Why This Topic?

Starting from this video, new videos will be covering different topics. This one is about pancreatic cancer. In this presentation, I will cover the prevalence, risk factors, and other information about the epidemiology of pancreatic cancer. After this, I will discuss ways to minimize your risk of getting pancreatic cancer and what to do if you have pancreatic cancer.



# Epidemiology of Pancreatic Cancer

# The GBD Study

The Global Burden of Disease (GBD) Study is conducted every year to determine the prevalence of diseases and risk factors around the world. The latest data is GBD 2019, but the best analyses are from 2017. The [Table 1](#) summarizes data from a study of pancreatic cancer prevalence from 1990 to 2017 that used GBD data.<sup>1</sup>



# Table 1

## Global Prevalence of Pancreatic Cancer (GBD 2017)

	Overall	Men	Women
Cases	448,000	232,000	216,000
Deaths	441,000	226,000	215,000
Prevalence	5.7 (95% UI 5.6-5.8)	N/A	N/A



# Pancreatic Cancer Risk Factors

# Risk Factors for Pancreatic Cancer

Based on two review articles in the *International Journal of Epidemiology* and *Journal of Clinical Medicine*, the following are some of the risk factors for pancreatic cancer:<sup>2,3</sup>

- Smoking tobacco
- Consuming high amounts of alcohol
- Bad dietary habits
- Diabetes
- Low physical activity
- Obesity
- Poor oral health

Each risk factor will be covered in detail in the upcoming slides.



# **Risk Factors in Detail**

# Risk Factor 1: Cigarette Smoking

- Cigarette smoking is a key risk factor for pancreatic cancer. To determine the role that cigarette smoking plays in pancreatic cancer risk, I searched PubMed for relevant studies. 13 studies were found, which included 3 systematic reviews, 5 case-control studies, and 5 cohort studies (10 observational).<sup>4-16</sup>
- Two systematic reviews found that cigarette smoking increased the risk of pancreatic cancer.<sup>4,7</sup> The first found that smokers had increased risk of pancreatic cancer, with women experiencing a higher risk increase than men.<sup>4</sup> The second, however, found that cigarette use increased pancreatic cancer risk twofold generally.<sup>7</sup>
- The cohort studies that were included found that cigarette smoking was associated with a higher risk of pancreatic cancer, although the risk increase was different between studies.<sup>5-6,11,13</sup>

# Risk Factor 1: Cigarette Smoking

- Case-control studies generally found that cigarette smokers had a higher risk of pancreatic cancer.<sup>8,10,12,14</sup> However, one case-control study found that female smokers with other diseases were more likely to get pancreatic cancer.<sup>14</sup>
- One data analysis from 1983 in the *American Journal of Public Health* predicted that male smokers would have lower pancreatic cancer rates than female smokers.<sup>15</sup> This conclusion was similar to that of the previously mentioned case-control study.<sup>14</sup>
- The third systematic review examined found that cigar smoking affected pancreatic cancer risk, while cigarette pipes and smokeless tobacco did not affect pancreatic cancer risk.<sup>9</sup>

# Risk Factor 1: Cigarette Smoking

- Finally, one 1983 study of Norwegian males found that an association between cigarette smoking and pancreatic cancer was not well-supported.<sup>16</sup>
- In conclusion, cigarette smoking is associated with higher risk of pancreatic cancer. This association has been shown in several studies and confirmed in systematic reviews and meta-analyses.

## Risk Factor 2: Alcohol Consumption

- Alcohol consumption, like smoking, is a key risk factor for pancreatic cancer. To determine the role that alcohol consumption plays in pancreatic cancer risk, I searched PubMed for relevant studies. 8 studies were found, which included 1 systematic review, 2 case-control studies, and 5 cohort studies (7 observational).<sup>13,16-22</sup>
- Cohort studies generally found that alcohol consumption increased pancreatic cancer risk.<sup>13,16,19,21-22</sup> However, some studies found exceptions to the general conclusion.<sup>19,21-22</sup> A 2010 cohort study, for example, found the general conclusion to apply only to men and not to women.<sup>19</sup> Other studies found that light to moderate consumption of alcohol and certain types of alcohol did not increase pancreatic cancer risk.<sup>21-22</sup>



## Risk Factor 2: Alcohol Consumption

- The two case-control studies included had different conclusions.<sup>17-18</sup> The first case-control study examined 345 cases of pancreatic cancer and 1,285 control participants without pancreatic cancer, finding that smokers had twofold increased risk of pancreatic cancer, but non-smokers who consumed alcohol heavily did not increase their risk.<sup>17</sup> The second case-control study found that high alcohol consumption caused pancreatic cancer only in men.<sup>18</sup>
- Finally, a systematic review of 19 studies found that heavy alcohol consumption was associated with higher pancreatic cancer risk.<sup>20</sup>
- In summary, alcohol consumption is correlated with higher pancreatic cancer risk generally.

## Risk Factor 3: Poor Diet

- Poor diet is another major risk factor for pancreatic cancer. To determine the role that poor diet plays in pancreatic cancer risk, I searched PubMed for relevant studies. 14 studies were found, which included 6 systematic reviews, 1 case-control study, and 7 cohort studies (8 observational).<sup>21,23-35</sup>
- Several foods were analyzed across the 14 studies examined. **Table 2** on the next slide shows the foods that were found to be beneficial, have no effect, or were harmful across studies.
- Generally, fruits and vegetables as well as whole grains were found to be beneficial in reducing pancreatic cancer risk, while red and processed meats were not.

# Table 2

## Effects of Different Foods and Diets on Pancreatic Cancer Risk

Negative Effect	No Effect	Positive Effect
Red meat <sup>23-24,34</sup>	Fish <sup>28</sup>	Fruits and vegetables <sup>21,23-24</sup>
Processed meat <sup>23-24,34-35</sup>	Nuts <sup>29</sup>	Whole grains <sup>24</sup>
Processed foods <sup>24</sup>	Mediterranean diet <sup>25,31,33</sup>	Low-fat dairy products <sup>24</sup>
Margarine <sup>23</sup>	Inflammatory foods <sup>30</sup>	Non-red and unprocessed meat <sup>24</sup>
–	WCRF/AICR diet <sup>27</sup>	Low-fat dietary pattern <sup>26</sup>
–	Coffee <sup>23</sup>	Butter <sup>23</sup>
–	–	Vitamins (especially B12 and D) <sup>32</sup>

## Risk Factor 4: Diabetes

- Diabetes is another major risk factor for pancreatic cancer. To determine the role that diabetes plays in pancreatic cancer risk, I searched PubMed for relevant studies. 12 studies were found, which included 1 systematic review, 1 case-control study, 3 narrative literature reviews, 1 lab study and 6 cohort studies (8 observational).<sup>36-47</sup>
- The systematic review that was found examined 36 observational studies with a total of 9,200 participants. The researchers found that type 2 diabetes patients are at higher risk of getting pancreatic cancer than normal individuals without diabetes.<sup>36</sup>
- The case-control study was from 2012 and included 3,340 participants in total from the NCI Pancreatic Cancer Cohort Consortium. The researchers found that participants with diabetes were more likely to get pancreatic cancer.<sup>39</sup>

## Risk Factor 4: Diabetes

- The cohort studies included in this analysis also came to the conclusion that diabetic individuals had a higher risk of pancreatic cancer.<sup>37-38,40,42,45,47</sup> Risk increases varied across studies, and short-term diabetes increased pancreatic cancer risk in one study.<sup>42</sup> In addition, individuals with pancreatitis who also had diabetes were more likely to get pancreatic cancer.<sup>40</sup>
- In two narrative reviews that were included, type 2 diabetes was associated with increased risk of pancreatic cancer.<sup>43,45</sup> A third narrative review found that individuals with type 3 diabetes were also more likely to get pancreatic cancer.<sup>41</sup>
- Finally, one lab study from 2018 found that diabetes increased risk of pancreatic cancer due to the effects of hyperglycemia (high blood sugar).<sup>46</sup>

## Risk Factor 5: Physical Activity

- Low physical activity is another major risk factor for pancreatic cancer. To determine the role that low physical activity plays in pancreatic cancer risk, I searched PubMed for relevant studies. 14 studies were found, which included 3 systematic reviews, 1 narrative literature review, 1 data analysis, 1 randomized controlled trial and 7 cohort studies (7 observational).<sup>48-61</sup>
- Overall, the cohort studies examined found that exercise was beneficial in reducing pancreatic cancer risk.<sup>48-49,51,53,55,58,61</sup> However, two studies differed from this conclusion. The first (Ontario Pancreas Cancer Study) was inconclusive and the second found no benefit or harm from exercise (Japanese Collaborative Cohort Study).<sup>51,55</sup>
- Of the systematic reviews found, three examined exercise as pertaining to pancreatic cancer risk. All found a beneficial effect of exercise.<sup>50,52,59</sup>

## Risk Factor 5: Physical Activity

- One systematic review examined the effects of physical activity on pancreatic cancer patients and found psychological benefits of physical activity.<sup>54</sup>
- The narrative review found a beneficial effect of exercise on pancreatic cancer risk, finding a risk reduction of 9 to 25 percent.<sup>56</sup>
- The randomized controlled trial included examined 47 participants, finding that pancreatic cancer patients had reduced disease burden if they exercised.<sup>57</sup>
- The data analysis looked at patients in the Canadian National Enhanced Cancer Surveillance System and found that patients whose data was included had reduced risk of pancreatic cancer if they exercised regularly.<sup>60</sup>

## Risk Factor 6: Obesity

- Obesity is another major risk factor for pancreatic cancer. To determine the role that obesity plays in pancreatic cancer risk, I searched PubMed for relevant studies. 10 studies were found, which included 1 systematic review, 3 narrative literature reviews, 1 case-control study, 1 data analysis, and 4 cohort studies (6 observational studies total).<sup>55-56,60-67</sup>
- The systematic review examined 14 case-control and cohort studies in total and found that obesity was correlated with a 19% increase in pancreatic cancer risk, but that obesity could not be attributed to the increase.<sup>63</sup>
- The narrative literature reviews included all supported a connection between obesity and increased pancreatic cancer risk.<sup>56,64-65</sup> However, one systematic review found only moderate-certainty-level evidence to support this conclusion.<sup>57</sup>



## Risk Factor 6: Obesity

- The case-control study included examined 14,374 participants in 2017 and found that higher BMI was associated with increased risk of pancreatic cancer.<sup>67</sup> This is in essence still an indictment of obesity because BMI is a measure of weight.
- The cohort studies all supported the conclusion that high BMI conferred higher risk of pancreatic cancer.<sup>55,61-62,66</sup> In particular, three of the studies examined high BMI in children and followed them up to see the impact on pancreatic cancer risk later in life, finding increased risk later in life.<sup>55,62,66</sup>
- Finally, the data analysis showed that patients in the Canadian National Enhanced Cancer Surveillance System who were obese had higher risk of pancreatic cancer later in life.<sup>60</sup>

## Risk Factor 7: Poor Oral Health

- Poor oral health is another major risk factor for pancreatic cancer. To determine the role that poor oral health plays in pancreatic cancer risk, I searched PubMed for relevant studies. 6 studies were found, which included 3 systematic reviews, 1 case-control study, and 2 cohort studies (3 observational studies total).<sup>68-73</sup>
- Of the three systematic reviews, two evaluated periodontal diseases generally. Both systematic reviews found that periodontal (gum) diseases increased risk of pancreatic cancer.<sup>70,73</sup> The third systematic review found that periodontitis (a gum disease) and edentulism (a disease of the teeth) increased pancreatic cancer risk.<sup>72</sup>
- The case-control study found that certain oral bacteria increased pancreatic cancer risk.<sup>69</sup>

## Risk Factor 7: Poor Oral Health

- Finally, the cohort studies found that poor oral health was associated with increased risk of pancreatic cancer and that male non-smokers with antibodies to an oral bacteria had increased risk of pancreatic cancer.<sup>68,71</sup>
- In conclusion, poor oral health and presence of certain bacteria increases risk of pancreatic cancer.



# Mitigating Pancreatic Cancer Risk

# Lifestyle Factor Mitigation

To mitigate one's risk of getting pancreatic cancer, there are several actions one can take:

- Avoid cigarette smoking
- Avoid high alcohol consumption
- Eat healthily (include fruits, vegetables, and whole grains in your diet and minimize processed foods)
- Exercise regularly
- Brush one's teeth and floss regularly

# Medical History

Previous surgeries and diseases in one's medical history can increase that person's risk of getting pancreatic cancer. These include but are not limited to:<sup>2</sup>

- Cholecystectomy (gallbladder removal)
- Gastrectomy (stomach removal)
- Pancreatitis
- Diabetes
- Metabolic syndrome
- Hepatitis B and C



# Conclusion

# Key Points

- Pancreatic cancer is a major disease that affects thousands of people around the world.
- Key risk factors for pancreatic cancer include cigarette smoking, alcohol consumption, poor diet, low physical activity, diabetes, obesity, and poor oral health.
- Maintaining a healthy diet and lifestyle can minimize one's chances of getting pancreatic cancer.
- People with certain medical conditions may be at higher risk of getting pancreatic cancer. Thus, if you have one or more of the medical conditions on slide 60, you should speak with your doctor.



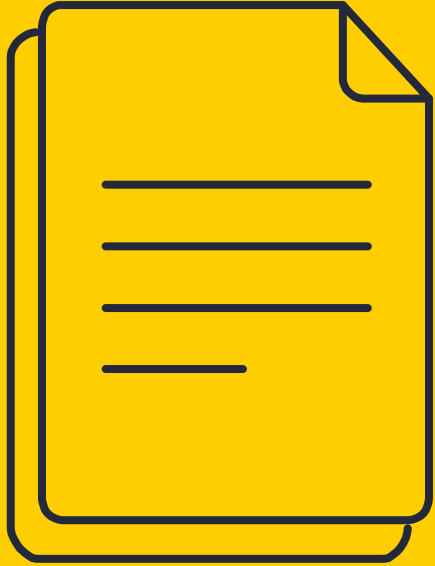


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# References

# References

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