

Smoking and Wound Healing

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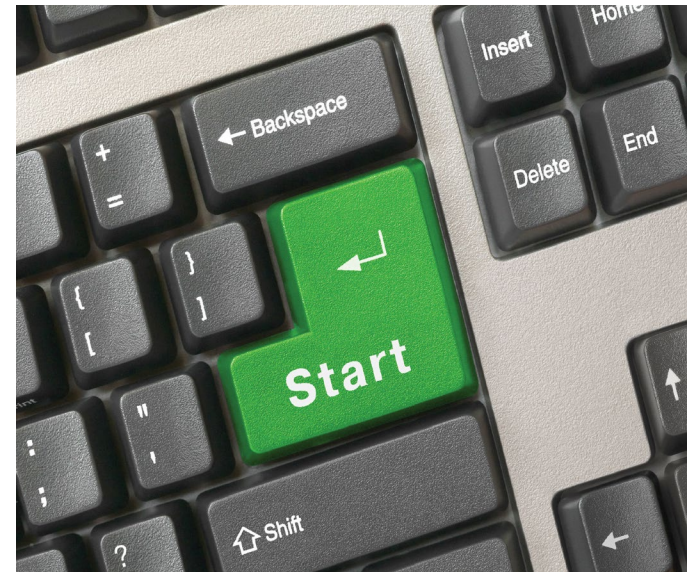
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Introduction

- Smoking is often admonished by healthcare professionals for its ability to cause serious diseases
 - puffing on a cigarette does more than just increase your risk for developing cancer and emphysema – it can also decelerate your body's natural wound healing process.
- The link between wound healing and smoking.

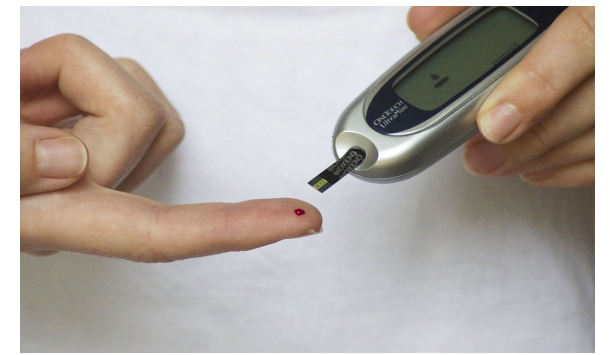




Smoking prevents wounds from receiving enough oxygen

- After being inhaled, oxygen travels through the blood stream to the wound, where it becomes essential in the biological battle to fight infection, regenerate tissue and return to health.
- Smoking holds back the body from being able to win this battle.
- Chemicals found in cigarettes—and cigarette smoke—can cause respiratory and cardiovascular problems, both of which can reduce the amount of oxygen that is able to receive, explained the National Health Service.
- Cigarettes also cause users to inhale carbon monoxide, which connects to red blood cells and prevents adequate amounts of oxygen from passing through the bloodstream.

Smoking raises blood sugar levels



- Heightened blood sugar levels have numerous medical consequences
 - Deceleration of the wound healing process
- High blood sugar, which can be caused by smoking, creates arterial stiffness and narrows the blood vessels.
- An elevated blood sugar level can also make red blood cells cluster together
- Cell clumps are often unable to pass through capillaries, which can result in a lack of sufficient blood flow to **healing wounds**.

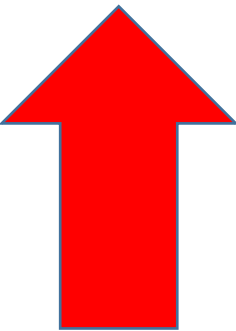
Smoking Increases Pain

- Normal pain levels can be greatly exacerbated in patients with smoking habits
- Cigarette-related chemicals have been shown to negatively impact the way bodies understand “pain signals”
- Smoking can also aggravate inflammatory markers, which can boost pain and add to the difficulties of the healing process.



STUDY: Effects of smoking on cost and duration of hyperbaric oxygen therapy for diabetic patients and non-healing wounds

- One physician visited five hyperbaric facilities and reviewed records on 1,006 patients who had received HBO2T for diabetic wounds.
- Factors such as outcome, age, duration of diabetes, transcutaneous oxygen baseline in the air at ambient conditions, Wagner score of the worst wound, smoking history, and intensity of treatment were looked at.
 - These factors were statistically significant predictor of treatment outcome using multiple regression modeling.
 - No Difference was found between smokers with less than 10 pack year of cumulative history and nonsmokers.
- After that point there was a significant increase in the number of HBO2Ts needed to produce at least some healing in smokers vs. patients who had never smoked.
- **The average patient with a greater than 10 pack year smoking history** required 14 more HBO2Ts.**
- **This translates into an added treatment cost \$4,000 to \$7,000 for the average patient who has smoked , and an estimated \$22-37 million annually for the United States.**



References

- Effects of smoking on cost and duration of hyperbaric oxygen therapy for diabetic therapy for diabetic patients with non healing wounds.
<https://pubmed.ncbi.nlm.nih.gov/11011798/>
- ** is calculated by multiplying the number of packs of cigarettes smoked per day by the number of years the person has smoked. For example, 1 pack-year is equal to smoking 20 cigarettes(1pack) per day for 1 year, or 40 cigarettes per for half a year, and so on.

Procedure – What Do **YOU** Need To Do?

- Discuss the effects of smoking and wound healing with your patients
- Document your discussions in the teaching record portion of the patient's chart
- This discussion should not be judgmental, but rather educational and factual.
- Avoid such things as remarking on smell or commenting on smoking (keep personal judgement out)
- Remember you may be given them information no one has given them before.
- Your goal should be to help support them toward quitting.

Post Test & Discussion = Question 1

Smoking has no effect on wounds, this is just a myth the doctor tells to get people to stop smoking.

True or False



**DON'T EVEN
THINK OF IT**

Post Test & Discussion = Question 2

One study shows that there is little difference if the patient has only been smoking 1 Pack per day for less then ten years.

What should we counsel our patient about this?

The less a patient smokes, the chances they will heal more quickly increases. Faster healing reduces the medical cost for the patient and the health system.



Post Test & Discussion = Question 3

When patients are being treated in the Hyperbaric Chamber they receive so much oxygen that it overcomes the effects of smoking.

True of **False**

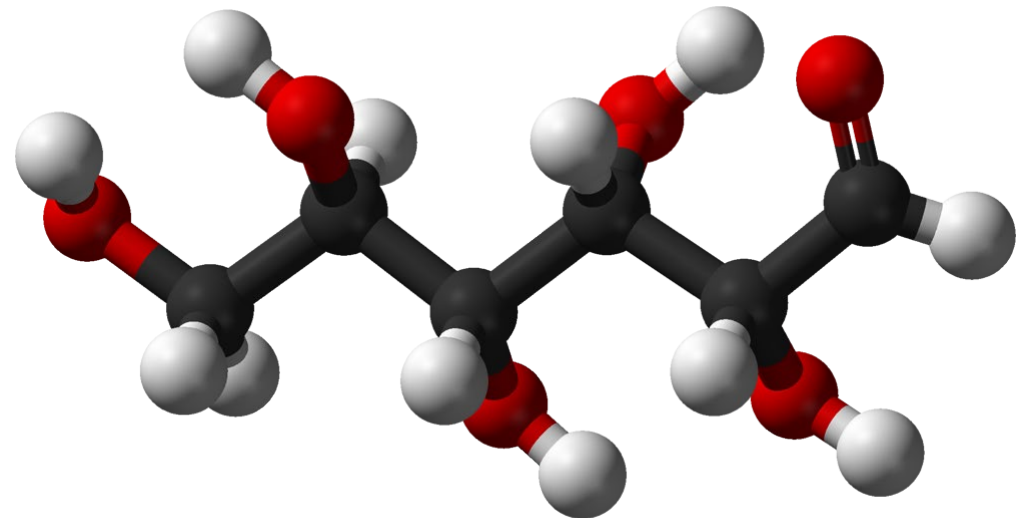


Post Test & Discussion = Question 4

How will smoking effect a diabetic's blood sugar? Raises it

Will this effect wound healing?

Yes, higher blood sugar decreases overall blood flow to the wound

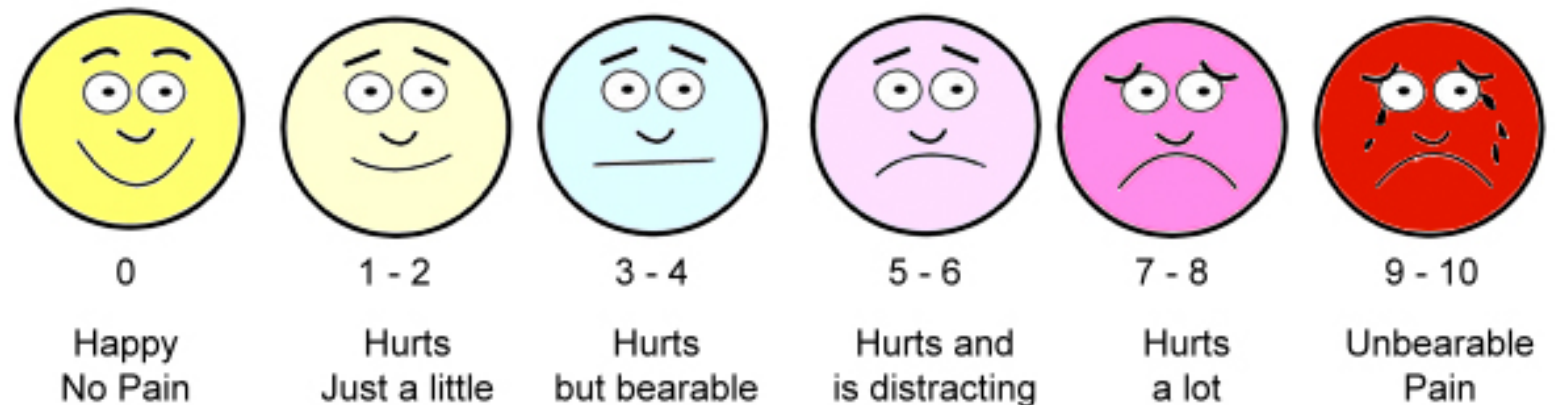


Post Test & Discussion = Question 5

How will smoking effect pain levels? Increases pain levels

Why? Cigarette-related chemicals negatively impact “pain signals” and smoking aggravates inflammatory markers

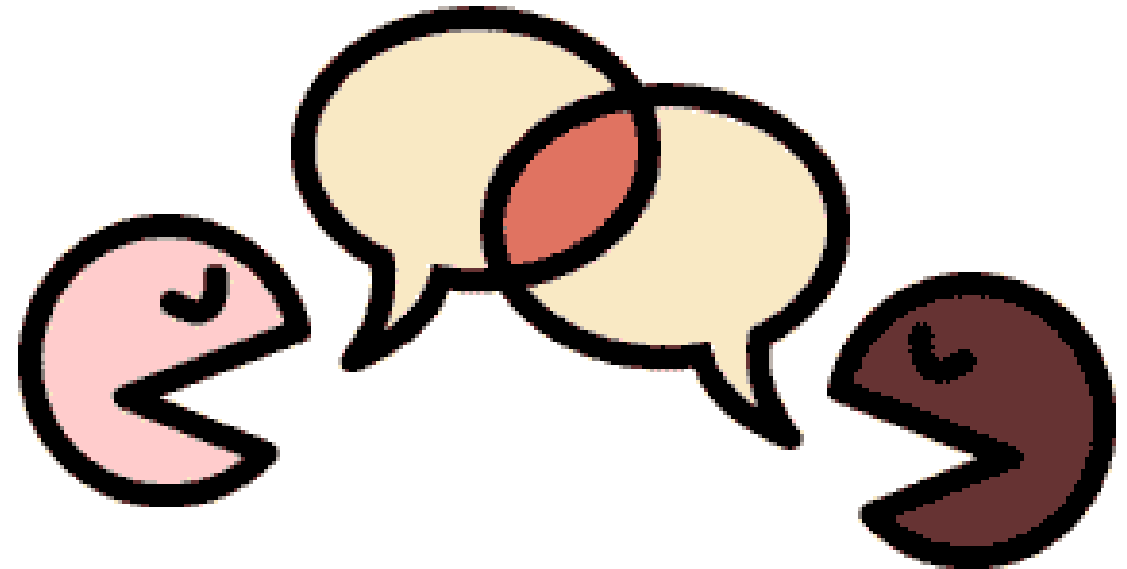
Pain Levels



Post Test & Discussion = Question 6 (BONUS)

Propose ways you could approach your patients about smoking?

- Discuss the different ways smoking effects wound healing in a supportive and nonjudgmental way.
- Provide facts and try to focus on education.
- Encourage their efforts to quit smoking



TEAM DISCUSSION

- Should we treat smokers with HBOT?



QUESTIONS?

