

1 **Smoke Evacuation: A Novel Solution in a Busy Clinical Environment**

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31 Surgical smoke from electrocautery and laser therapy is a commonly encountered hazard in  
32 dermatologic surgery. The health risks of surgical smoke are well documented. These risks  
33 include exposure to infectious particles and mutagenic compounds. Furthermore, there have been  
34 multiple animal studies demonstrating acute and chronic inhalational injuries.<sup>1</sup> For reference, it's  
35 estimated that the smoke generated from 1.0 gram of electrocauterized tissue has a mutagenic  
36 potential equivalent to 6 cigarettes.<sup>2</sup>

37

38 Unfortunately, smoke evacuation represents a challenge in a busy clinical environment. The  
39 smoke evacuator apparatus traditionally requires an additional set of hands. This presents an  
40 obstacle when operating alone or when the procedure requires both of the assistant's hands. The  
41 solution depicted provides efficient smoke evacuation while freeing the hands of both surgeon  
42 and assistant.

43

44 In this setup, the smoke evacuator is clipped securely to an easily adjustable Delasco metal stand  
45 available in most catalogs for surgical equipment. The flexible portion of the stand allows the  
46 evacuator to be oriented so that it is within the National Institute for Occupational Safety and  
47 Health recommended distance, 5.1 cm, from the site of cautery and positioned in a manner that  
48 does not block the surgeon's visual field.<sup>1</sup> A sterile towel is draped over the flexible neck to  
49 allow adjustments. A foot pedal enables the surgeon to easily turn on the smoke evacuator  
50 without releasing the electrosurgical device. The stand also adjusts vertically to increase its  
51 utility in different patient positions. This simple piece of equipment allows for efficient hands-  
52 free smoke evacuation (**Figure 2**).

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## References

56 1. Georgesen C, Lipner SR. Surgical smoke: Risk assessment and mitigation strategies. *Journal*  
57 *of the American Academy of Dermatology*. 2018;79(4):746-755. doi:10.1016/j.jaad.2018.06.003.

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59 2. Yoshifumi T, Shigenobu M, Kazuto N, et al. Mutagenicity of smoke condensates induced by  
60 CO<sub>2</sub>-laser irradiation and electrocauterization. *Mutation Research/Genetic Toxicology*.

61 1981;89(2):145-149. doi:10.1016/0165-1218(81)90120-8.

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64 Figure 1: "Smoke evacuation set-up"

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69 Figure 2: "Smoke evacuation during surgery"

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