

References to the CarbonAid™ gas diffuser

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Patents

US6994685; US6494858; EP1032322 (GB, DE, FR); SE515473; further patents are pending (including JP).



Cardia Innovation AB

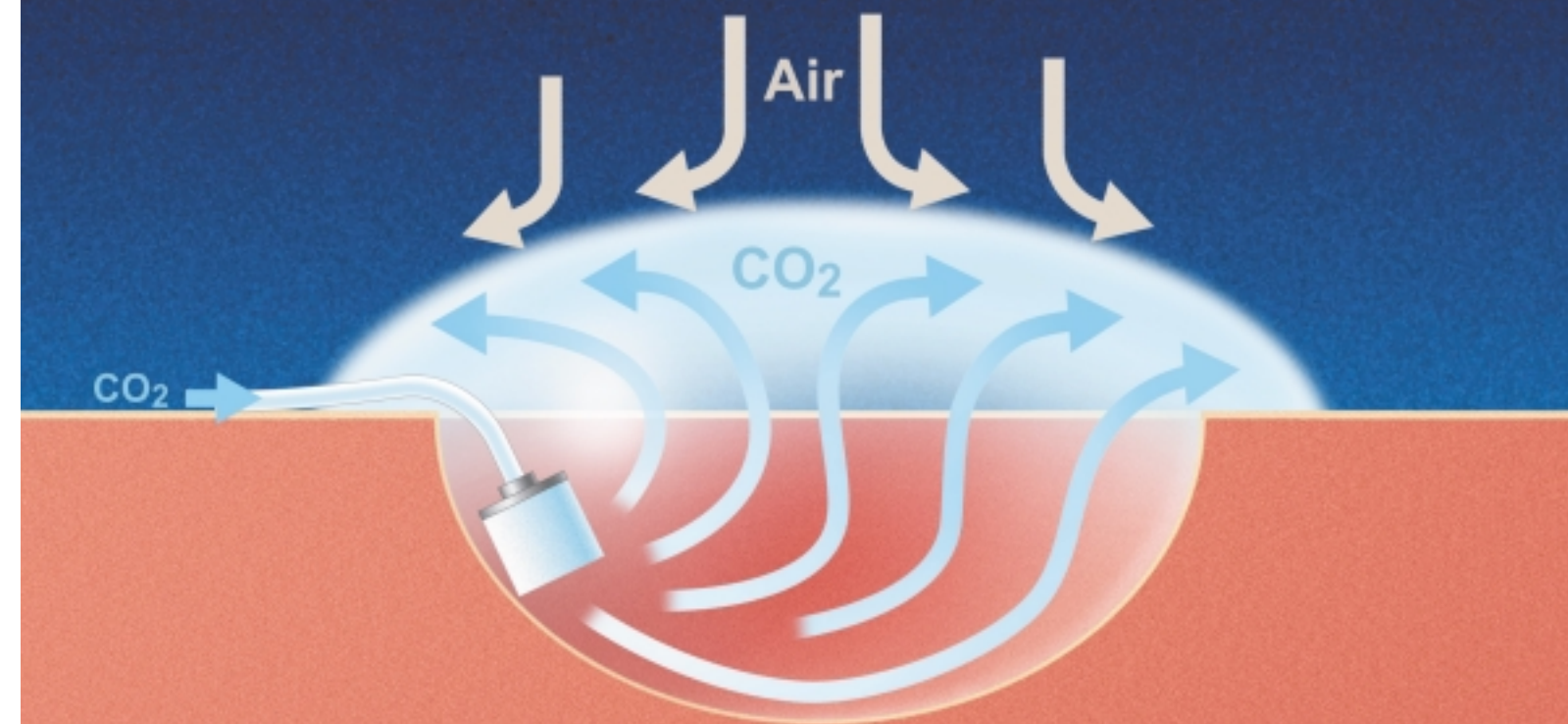
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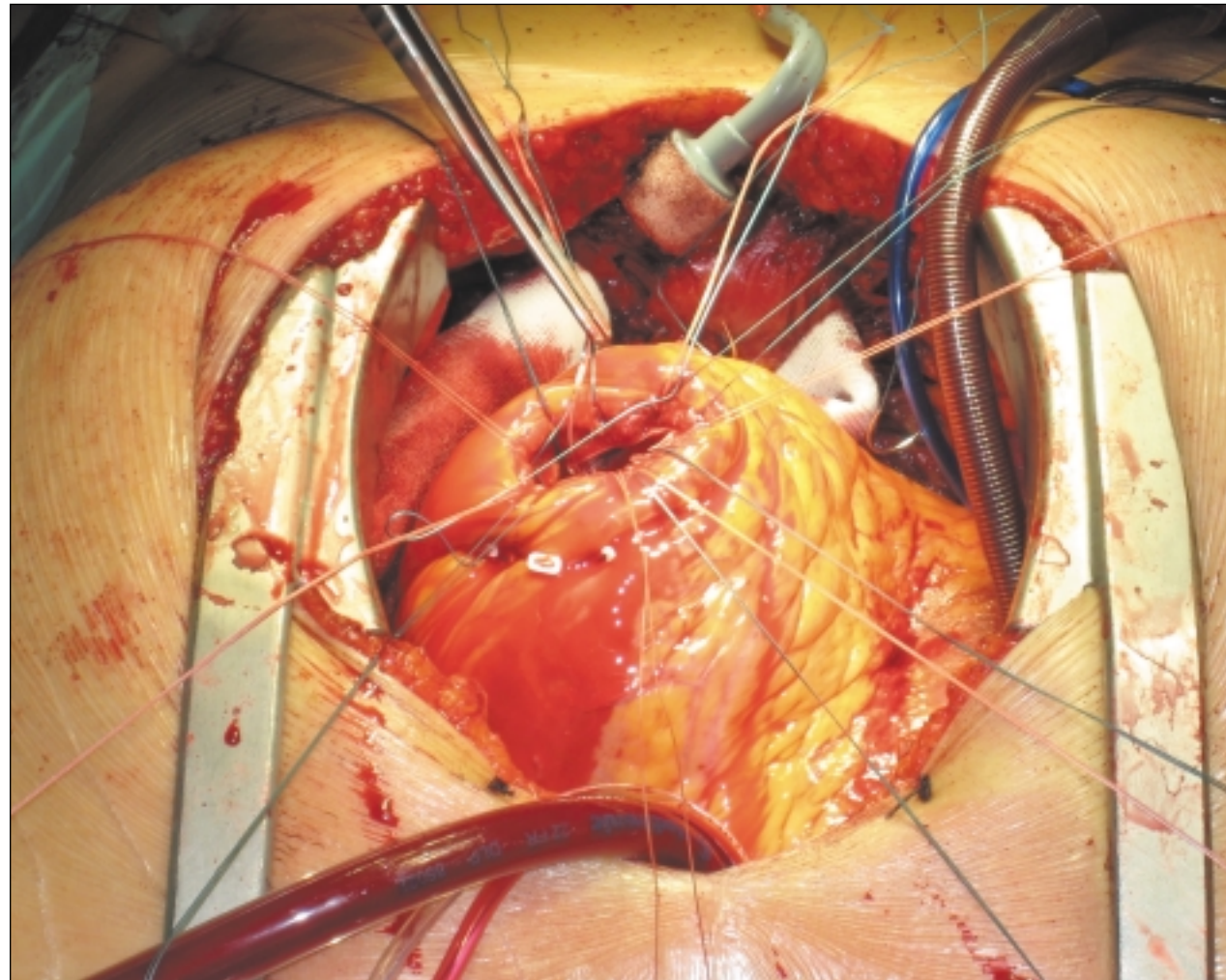
Why risk air embolism when it can easily be avoided?



The CarbonAid™ gas diffuser for efficient de-airing in cardiac surgery



A simple solution to a serious problem



In order to provide a high degree of de-airing (>99%), CO₂ has to be delivered from within the cardiothoracic wound cavity via the CarbonAid™ gas diffuser.^{4,10}

CO₂ insufflation into the cardiothoracic wound cavity should be started at a flow of 10 l/min at least one minute before incision of the heart and great vessels, so that potential gas traps will be filled with CO₂ instead of air.^{10,17}

A CO₂ flow at 10 l/min is needed to compensate for the continuous loss of CO₂ due to diffusion and convective air currents.^{10,14,16}

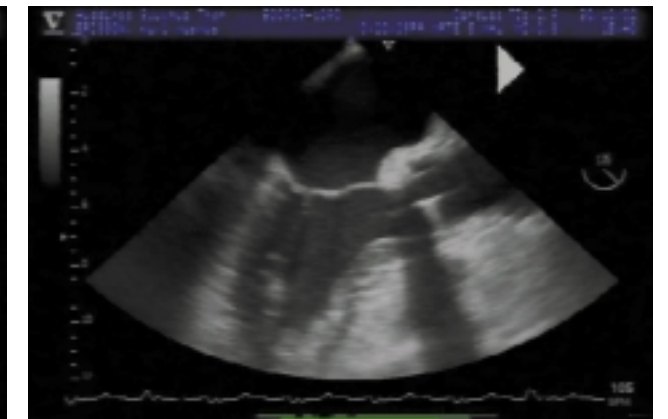
Since CO₂ is not a liquid that remains in the wound but a gas that, although heavy, disperses into the surrounding air, CO₂ insufflation has to be continued as long as the heart and vessels are open.^{10,17}

Well proven through routine use & clinical studies

In a trial 20 patients undergoing valve surgery were randomized either to a control group (n=10) or to CO₂ insufflation into the wound cavity with the CarbonAid™ gas diffuser (n=10).⁷



Without CO₂



With CO₂

CO₂ insufflation into the cardiothoracic wound cavity with the CarbonAid™ gas diffuser markedly decreased the number of microemboli in the left atrium, left ventricle, and asc. aorta during open-heart surgery.⁷ (*Circulation* 2004;109:1127-32)



The CarbonAid™ gas diffuser has been shown to be the most effective device for de-airing of a cardiothoracic cavity and is the only reported device that stays efficient even when wet.^{6,15}

The attached bacterial filter protects against unintentional bacterial contamination from the CO₂ source.

The CarbonAid™ gas diffuser allows for a high laminar outflow of CO₂ at a low outflow velocity. By avoiding turbulence it creates a total CO₂ atmosphere within the wound cavity,^{10,14} thus eliminating any risk of air embolism.