



OXYGEN 93% VS. OXYGEN 99%: GUARANTEED EQUAL QUALITY PATIENT CARE

Oxygen 93% (O₂93) provides the same quality of patient care as oxygen 99% (O₂99). Clinical and scientific studies in Great Britain, Canada, and the United States have demonstrated that, regardless of whether the oxygen supply is O₂93 from oxygen concentrators or O₂99 from cylinders or liquid storage devices, the standard of clinical care remains the same. Several physiological studies have addressed the issue of inspired oxygen (FiO₂) in patients. In a study that examined the efficacy of different oxygen delivery systems, patients were administered both O₂93 and O₂99 at 2 L/min, 3 L/min, and 4 L/min. Results demonstrated that FiO₂ changed, but that the difference was due to different flow rates. At each flow rate, there was statistically no difference in FiO₂ between the different concentrations of oxygen.¹

Other studies have looked at overall patient health and care. In Canada, forty-eight hospitals were surveyed regarding their ten-year experience using oxygen concentrators as their primary oxygen supply. There were no reported adverse consequences as a result of the source of oxygen and the authors concluded that oxygen concentrators which meet Canadian standards are “safe, reliable, and cost effective.” Yet perhaps most revealing, many of the hospitals reported improved overall care and increased consumption after switching to oxygen concentrators, as the reliable and cost-effective supply of oxygen provided by concentrators allowed them to prescribe oxygen more frequently.²

Many international healthcare organizations recommend oxygen concentrators on an equal basis as cylinders for oxygen supply. WHO regards oxygen concentrators as an “effective means of supplying oxygen.”³ In a comparison between cylinders and concentrators, the Association of Anaesthetists of Great Britain and Ireland focused on cost, maintenance, reliability, and similar issues, not on the level of oxygen concentration, for choosing the best oxygen source.⁴ After years of using O₂93 in the field, the US military has declared O₂93 acceptable in any clinical application.

Beyond clinical considerations, switching to O₂93 does not require additional equipment vis-à-vis delivery systems. ISO has issued identical regulations regarding O₂93 and O₂99 delivery systems, and both the Canadian Standards Association (CSA) and the US military make no distinction between systems.⁵ In the previously mentioned study in Canada, all forty-eight hospitals sites used concentrators that provided O₂93 through existing O₂99 gas pipelines.

¹Mitchell, Brent E., Baker, Raymond, Gardner, Stephanie M., Holloway, I Aaron F., Todd, Larry A., “A Descriptive Study of the Percentage of Oxygen Delivered Using the Mercury Tube-Valve-Mask Breathing Circuit at 2 L/min Flow Rates,” Texas University Health Science Center, Defense Technical Information Center, 2002.

²Friesen, R.M., Raber, M.B., Reimer, D.H., “Oxygen concentrators: a primary oxygen supply source,” *Can J Anesth* 1999;46:1189.

³Department of Vaccines and Biologicals, “The Oxygen Concentrator,” in “WHO/UNICEF Product Information Sheets 2000,” World Health Organization, Geneva, 2000, p. 235.

⁴Association of Anaesthetists of Great Britain and Ireland, “Oxygen, Gas Supplies, Equipment, and Maintenance,” *Anaesthesia Resource Vol. 1*, 2004.

⁵Janny Enterprises, “The Clinical Utilization of 93% Oxygen in Civilian Commercial Markets,” 2005, p. 7.