

## Portable Oxygen Concentrators (POCs) by Chris Garvey FNP, MSN, MPA, MAACVPR

Portable oxygen concentrators (POCs) offer many advantages for persons needing oxygen. Like most technology, understanding a device's use and limitations is essential for effectiveness and safety. Manufacturers may not uniformly provide detailed device information which may limit both informed clinician prescribing and user knowledge and preparedness. Below are considerations that may help prospective and current users get the most out of POCs. *The following information is not a substitute for your provider's care and recommendations.*

**BENEFITS:** POCs offer benefits as well as limitations. Favorable device features include:

- Less dependence on durable medical equipment companies (DMEs) for oxygen delivery.
- Light weight devices may support activities outside of the home
- Improved potential for independence with travel including air travel.

**LIMITATIONS:** POCs have important limitations that require caution. There are important poorly understood or unknown aspects of POC technology. Some challenges include:

- **Smaller, lighter units produce a limited amount of oxygen (often 1 L/min or less), and less than larger units.**
- POCs generally rely on "pulsed dose" oxygen delivery, providing oxygen only during parts of the breath (generally the beginning of inspiration).
- **Devices using pulse dose (vs. continuous flow) are not a suitable substitute for continuous flow oxygen during sleep, with CPAP or bi-level, or with an Oxymizer cannula** (unless the device has continuous flow setting, e.g., SimplyGo or Sequal Eclipse).
- POCs are expensive and may not be covered by insurance or provided by DMEs.

A few important words of caution: Increase in respiratory rate such as with exercise results in lower oxygen pulse volume per breath especially if the pulse setting is not increased to compensate for increased respiratory rate. **Users need to check oxygen saturation (SpO<sub>2</sub>) levels with an oximeter to make sure the oxygen level is at least 88% during activity.** Ask your provider for goals for SpO<sub>2</sub>.

**POC's oxygen pulse-dose settings do not correspond to continuous 'liters/minute' flow rates prescribed by most providers.**




Monitor your SpO<sub>2</sub> with an oximeter under various circumstances during POC use to assure the oxygen saturation is safe, e.g., for most 88% or above based on *the provider's recommendations*.

**Before buying a POC**, ask your pulmonary MD or pulmonary rehabilitation staff for guidance regarding your oxygen needs. See 'maximum oxygen production' in the chart below (line 2) to determine if a POC will meet your needs. Consider that a flair-up (exacerbation), pneumonia, worsening of lung disease, exercise and travel (high altitude +/- aircraft) normally *increase your oxygen needs*. Ask your provider if you should always keep your oxygen setting at the same level or adjust it based on your SpO<sub>2</sub> reading – known as '*titrate to migrate*' or '*titrate to saturate*'. You need to purchase an oximeter and understand how to use it. If you aren't sure, ask your provider or pulmonary rehab staff. Read credible sources (below) to understand how POCs work. Make sure you know the:

- Amount of oxygen the POC produces, settings, battery life (duration), size, weight, sound level and how you will carry it or roll it.
- Oxygen prescription you need now, understanding it may increase over time and exceed your POC's oxygen supply capability.
- POC manufacturer's and seller's ratings, warranty, and return and repair policy before buying.
- Complete manufacturer information provided with your POC's owner's manual, plus instructions on youtube videos for that POC.

## Portable Oxygen Concentrators (POCs)

The table below does not represent all available POCs. See device brochures for details, operations, limitations, etc. All POCs below are FAA approved for flight. Information including price should be considered estimates.

|  | Inogen One G 5<br>      | Inogen One G 4<br>           | Inogen One G 3<br>           | Invacare Platinum<br>    | Precision EasyPulse 3/5<br> |
|--|--|---|---|---|--|
| <b>Maximum oxygen production (LPM) *</b> | <b>1.26 LPM</b>  | <b>0.63 LPM</b>   | <b>1.05 LPM</b>   | <b>0.88 LPM</b>   | <b>0.52 LPM (EP3)<br/>0.78 (EP5)</b>   |
| <b>Delivery Type</b>                     | <b>Pulse Dose 1-6</b>  | <b>Pulse Dose 1-3</b>   | <b>Pulse Dose 1-5</b>   | <b>Pulse Dose 1-4</b>   | <b>Pulse Dose 1-5</b>  |
| Max. delivered pulse volume              | 15 BPM** 84 ml<br>30 BPM 42 ml   | 15 BPM 42 ml<br>30 BPM 21 ml  | 15 BPM 70 ml<br>30 BPM 35 ml  | 15 BPM 59 ml<br>30 BPM 29 ml  | 15 BPM 35/ 52 ml<br>30 BPM 17/26 ml  |
| Weight + 1 battery***                    | 5 lb.  | 3 lb.   | 5 lb.   | 6 lb.   | 5 lb. /7 lb.   |
| Battery time                             | 4 hours  | 2.3 hours   | 3 hours   | 2.5 hours   | 4 / 3.4hours   |
| Max altitude                             | 10,000 ft.   | 10,000 ft.  | 10,000 ft.  | 10,000 ft.  | 9,000 ft.  |
| Estimated price                          | \$1895<br><a href="http://store.mainclinicsupply.com">store.mainclinicsupply.com</a>                     | \$1795<br><a href="http://oxygenone.com">oxygenone.com</a>  | \$1965<br><a href="http://oxygendirect.com">oxygendirect.com</a>  | \$1995<br><a href="http://healthproductsforyou.com">healthproductsforyou.com</a>                            | \$1665<br><a href="http://healthproductsforyou.com">healthproductsforyou.com</a>                               |
|  | AirSep FreeStyle3/5<br> | AirSep FreeStyle Comfort<br> | Respironics SimplyGoMini<br> | Respironics SimplyGo<br> | SeQual Eclipse 5<br>        |
| <b>Maximum oxygen production (LPM)</b>   | <b>0.5 (FS3)<br/>1.05 (FS5)</b>  | <b>1.05 LPM</b>   | <b>1.0 LPM</b>  | <b>2.0 LPM</b>  | <b>3.0 LPM</b>   |
| <b>Delivery Type</b>                     | <b>Pulse Dose 1-5</b>  | <b>Pulse Dose 1-5</b>   | <b>Pulse Dose 1-5</b>   | <b>Continuous 0.5 - 2 LPM<br/>Pulse dose 1-6</b>  | <b>Continuous: 0.5 - 3 LPM<br/>Pulse dose 1-6</b>  |
| Max. delivered pulse volume              | 15 BPM 33/ 67 ml<br>30 BPM 17/33 ml  | 15 BPM 70 ml<br>30 BPM 35 ml  | 15 BPM 55 ml<br>30 BPM 33 ml  | 15 BPM 72 ml<br>30 BPM 66 ml  | 96 ml<br>(Fixed Pulse Dose)  |
| Weight + 1 battery                       | 5/7 lb.  | 5 lb.   | 5 lb.   | 10 lb.  | 18.4 lb.   |
| Battery time                             | 3.5 / 2.5 hours  | 4 hours   | 4.5 hours   | 3 hours   | 3 hours  |
| Max altitude                             | 12,000 ft.   | 10,000 ft.  | 10,000 ft.  | 10,000 ft.  | 10,000 ft.   |
| Estimated price                          | \$1820<br><a href="http://tigermedical.com">tigermedical.com</a>   | \$2495<br><a href="http://oxygendirect.com">oxygendirect.com</a>  | \$1995<br><a href="http://healthproductsforyou.com">healthproductsforyou.com</a>                                | \$2090 <a href="http://healthproductsforyou.com">healthproductsforyou.com</a>                               | \$2500<br><a href="http://directhomemedical.com">directhomemedical.com</a>                                     |

\*LPM-liters per minute \*\*Breaths Per Minute \*\*\*Add ≥ 5 lb. for accessories

Adapted from **The Pulmonary Paper** Summer - 2021 • [Pulmonary Paper](https://pulmonarypaper.com/summer-2021/) <https://pulmonarypaper.com/summer-2021/>

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### Resources

- The Pulmonary Paper <https://www.pulmonarypaper.org/portable-oxygen-concentrators-comparison-chart-2019/>
- AARC Guide to POCs <https://www.copdfoundation.org/Downloads/POC-Final.pdf>
- Adventures of an Oxyphile<sup>2</sup> T Petty <https://www.drtoimpetty.org/wp-content/uploads/2012/03/Adventures-of-an-Oxy-Phile-2.pdf>
- <https://www.copdfoundation.org/COPD360social/Community/COPD-Digest/Article/309/How-a-Pulse-Oximeter-Works.aspx>
- Clinician Strategies to Improve Care of Patients Using Supplemental Oxygen [https://journal.chestnet.org/article/S0012-3692\(19\)31239-5/fulltext](https://journal.chestnet.org/article/S0012-3692(19)31239-5/fulltext)