



Recently, SmartDose was used on patients at the *Cheboygen Memorial Hospital – Cardio-Pulmonary Rehab*<sup>1</sup>. Two patients were tested on their current oxygen equipment, or on continuous flow, and then on the SmartDose system. Both were monitored with the CODR.

Note that each patient was tested with their own equipment or continuous flow first, then allowed to rest, and tested with SmartDose second to ensure that fatigue was not a factor in any favorable outcomes with SmartDose. Again, CODR was used to monitor the patients and record outcomes.

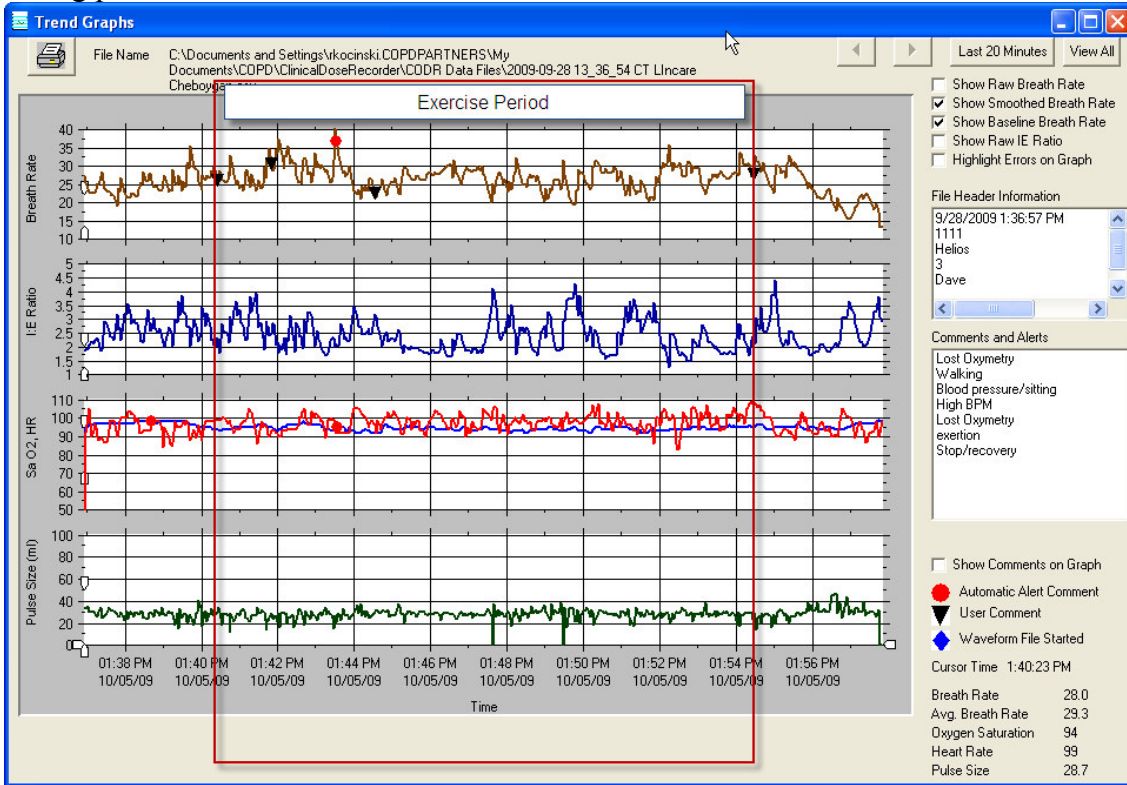
The first patient did reasonably well on their existing unit, but better on SmartDose. Clinical data shows that this patient could be set on SmartDose at one setting lower and would be likely to maintain acceptable saturations at rest and exercise, but would gain longer ambulation times from the portable due to the better control of dose throughout the day.

The second patient tested did almost as well on SmartDose on a 2 setting as she did on continuous flow at 2 LPM at rest / 3 LPM at exercise. The patient response to SmartDose was very positive and more ambulation time was available while saturations were maintained at acceptable levels.

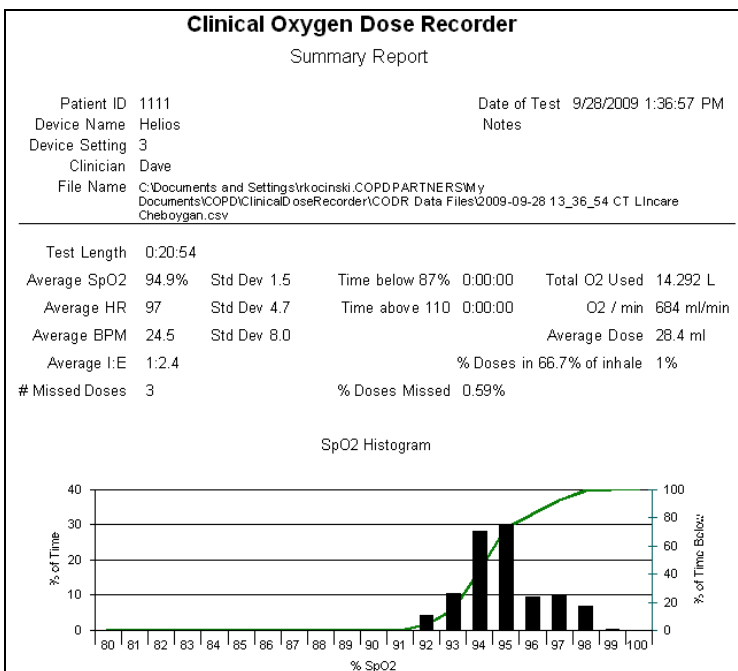
### **Summary**

In the patients tested, SmartDose maintained patient saturation better than standard oxygen conservers and gives patients the ability to ambulate longer with less breathlessness. SmartDose senses changes in breathing during activity and adjusts to the patient's needs for more oxygen, leading to improved saturations.

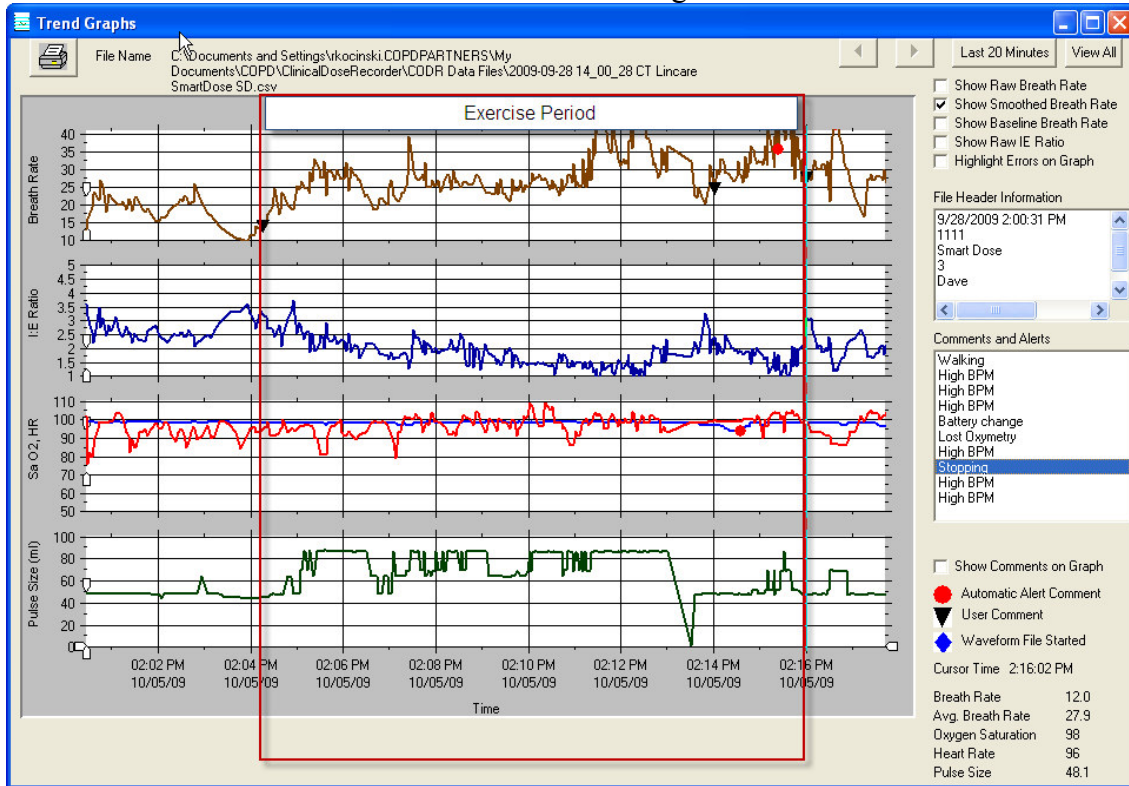
Patient 1 is a female using a Helios at a setting of 3. The exercise used was a recumbent bike. We can see below that her saturations stayed above 90% and her heart rate varied between 85 and 110 for the test period. Notice that dose varied little, but highest dose is during periods of lowest breath rate.



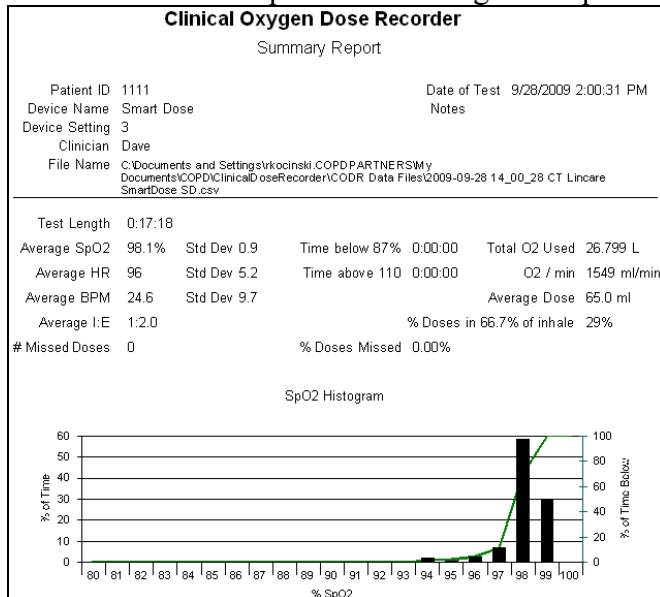
On the CODR summary report, we can see the patient had an average  $S_pO_2$  of 94.9% with an average dose of 28 ml per breath.



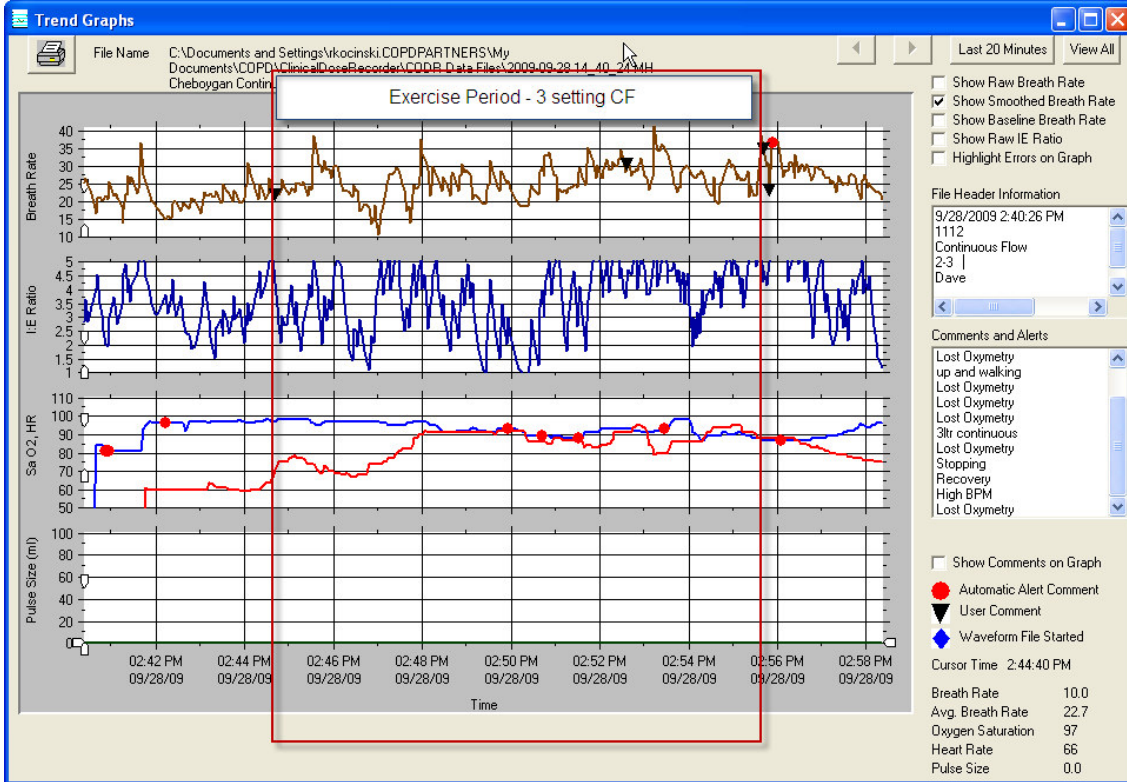
Testing was repeated on Patient 1 using the SmartDose portable while completing the same level of activity. If you look at the bottom graph, you can see how SmartDose is giving increased dosing in response to changes in breathing during exercise—**automatically**, which maintains higher saturations overall. Notice that saturations, while under control on the last test, are now even higher. Also notice that heart rate is reduced as well to between 80 and 100 for all but two readings in the test.



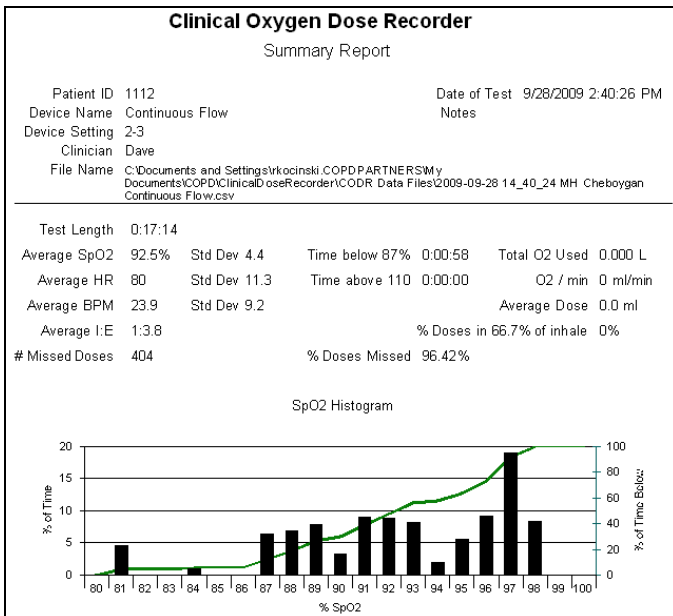
As we can see from the summary report below, Patient 1 had an increase in Avg. SpO<sub>2</sub> from 94.7 to 98.1% and had a slightly lower heart rate. Notice that average dose was 65 ml per breath. We can see above that base dose was approximately 48 ml (3 setting), but rose to 64 and 80 ml per breath during active periods.



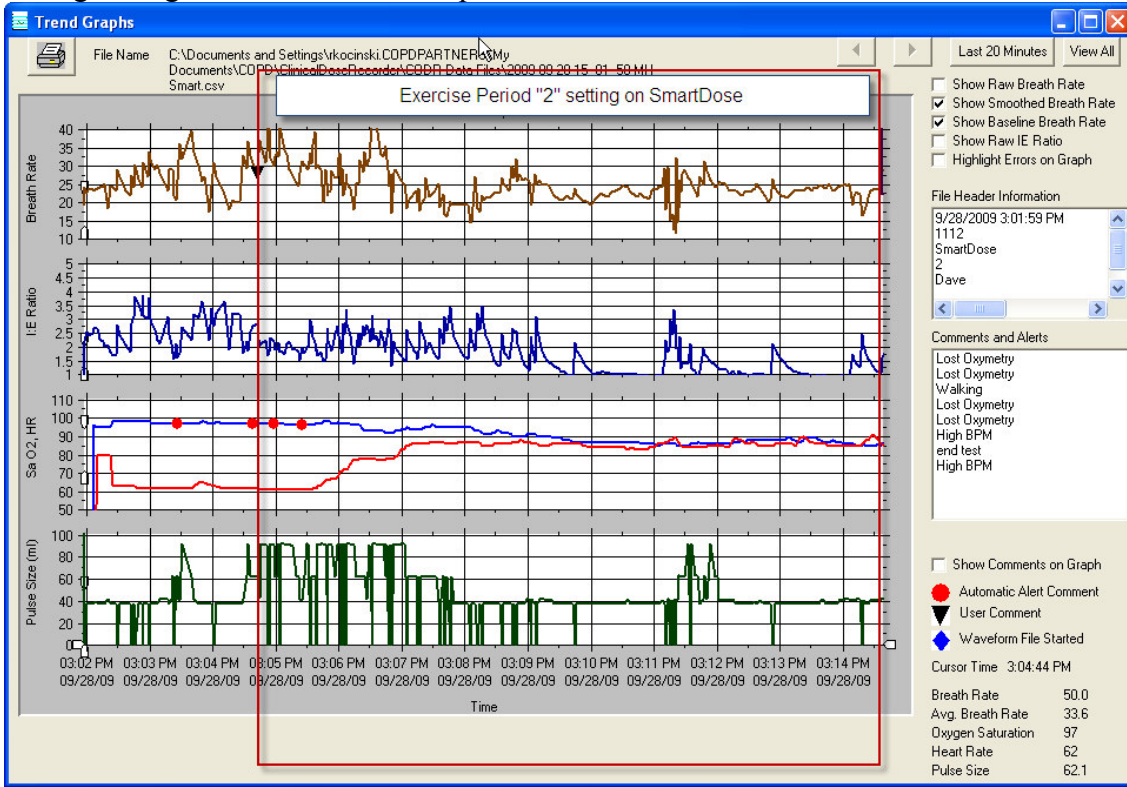
Patient 2 (female) was tested with continuous flow oxygen at settings of 2 LPM at rest and 3 LPM during exercise. Exercise was with treadmill.



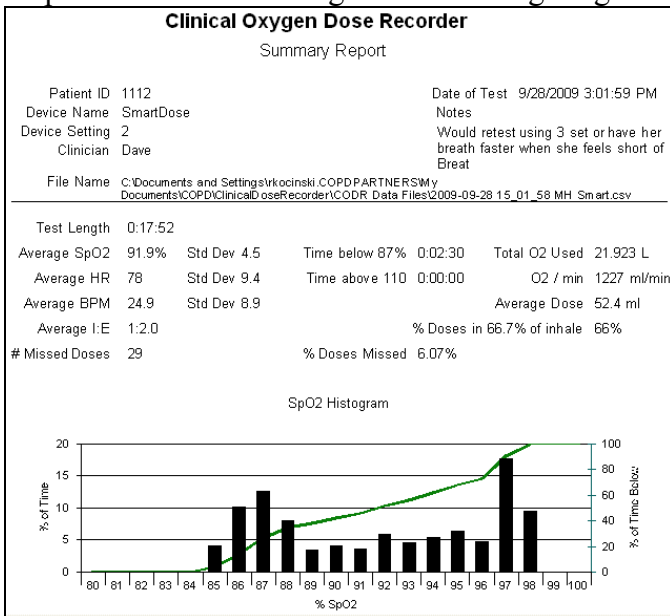
The summary report shows that at 3 LPM CF oxygen, this patient spent about 1 min of time below 87%  $S_pO_2$  and had an average of 92.5%.



On SmartDose, Patient 2 did almost as well as on CF at 3 LPM. Notice that the unit did auto-adjust up in dose (bottom graph) and did maintain saturations in a similar range. This patient's breath rate did get very controlled and as such, the unit delivered base dosing during some of the exercise period.



Patient 2's summary report on SmartDose shows similar results; a 0.8% drop in average SpO<sub>2</sub>, with slightly more time spent below 87%. We would recommend that this patient be on a base setting of 3 on SmartDose, but would expect that this setting would clearly outpace her current setting of 2/3 CF for giving her more freedom and ambulation time.



We can see from these results that the SmartDose's unique auto adjusting feature responds to changes in patient's breathing patterns during activity to reduce or eliminate desaturations seen during exercise while using other conserving devices. Patients also typically commented that they had reduced breathlessness and felt they would be able to continue activity longer using the SmartDose. These benefits have the potential to:

- Improve the patients' ability to complete activities of daily living with less breathlessness
- Increase the patients' exercise level and training duration during pulmonary rehabilitation
- Improve quality of life

Additionally, the CODR allows clinicians to clearly monitor changes in the patient's oxygen needs during activity and choose the portable oxygen system which best maintains adequate oxygen saturation.

SmartDose is available in liquid oxygen or gas cylinder versions. More information is available at [www.inspiredtechnologiesinc.com](http://www.inspiredtechnologiesinc.com)

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<sup>i</sup> Thanks to Cheboygan Memorial Hospital Cardiac Rehab in making this testing possible.