# CLAIMS

What is claimed is:

1. A method of providing therapeutic gas to patient, the method comprising:
sensing a current inhalation of the patient;
providing a flow of therapeutic gas to the patient based on the sensing; and
ceasing the flow of therapeutic gas to the patient based on a value indicative of previous inhalation duration.

2. The method of claim 1 wherein ceasing the flow of therapeutic gas further comprises ceasing based on a predetermined percentage of the value indicative of previous inhalation duration.

3. The method of claim 2 wherein ceasing flow further comprises ceasing the flow after a flow duration being sixty percent of the value indicative of previous inhalation duration.

4. The method of claim 2 further comprising assigning the value indicative of previous inhalation duration to be a duration of an immediately previous inhalation.

5. The method of claim 2 further comprising assigning the value indicative of previous inhalation duration to be an average duration of a plurality of previous inhalations.

6. The method of claim 2 further comprising assigning the value indicative of previous inhalation duration to be an average duration of three previous inhalations.

7. The method of claim 1 further comprising, after the ceasing, pre-charging a cannula with therapeutic gas prior to a subsequent inhalation of the patient.

8. The method of claim 7 wherein pre-charging the cannula further comprises providing a volume of therapeutic to the cannula that displaces only the gas in the cannula.

9. The method of claim 1 further comprising determining a most open airway, and wherein providing the flow of therapeutic gas further comprises providing the flow to the most open airway.

10. The method of claim 1 wherein providing the flow of therapeutic gas further comprises providing from a source of therapeutic gas having a dead-head pressure of 8 psig or less.

11. A therapeutic gas delivery device comprising:

a controller;

a first sensor electrically coupled to the controller and configured to fluidly couple to a first hose connection, the first sensor senses an attribute of airflow through the first hose connection;

a first valve electrically coupled to the controller and configured to fluidly couple a source hose connection to the first hose connection;

a second sensor electrically coupled to the controller and configured to fluidly couple to a second hose connection, the second sensor senses an attribute of airflow of the second hose connection;

a second valve electrically coupled to the controller and configured to fluidly couple the source hose connection to the second hose connection;

wherein the controller is configured to:

sense a current inhalation by way of the first sensor or the second sensor;

provide, based on the sensing, a flow of therapeutic gas to the first hose connection by way of the first valve; and

cease the flow of therapeutic gas to the first hose connection based on a value indicative of previous inhalation duration.

12. The therapeutic gas delivery device of claim 11 wherein when the controller ceases the flow of therapeutic gas, the controller is further configured to cease based on a predetermined percentage of the value indicative of previous inhalation duration.

13. The therapeutic gas delivery device of claim 12 wherein when the controller ceases the flow of therapeutic gas, the controller is further configured to cease the flow after a flow duration being sixty percent of the value indicative of previous inhalation duration.

14. The therapeutic gas delivery device of claim 12 wherein the controller is further configured to assign the value indicative of previous inhalation duration to be a duration of an immediately previous inhalation.

15. The therapeutic gas delivery device of claim 12 wherein the controller is further configured to assign the value indicative of previous inhalation duration to be an average duration of a plurality of previous inhalations.

16. The therapeutic gas delivery device of claim 12 wherein the controller is further configured to assign the value indicative of previous inhalation duration to be an average duration of three previous inhalations.

17. The therapeutic gas delivery device of claim 11 wherein the controller is further configured to, after the cessation, provide a pre-charge of therapeutic gas to both the first and second hose connections prior to a subsequent inhalation.

18. The therapeutic gas delivery device of claim 11 wherein the controller is further configured to determine, based on the first and second sensors, that the first hose connection has a greater flow volume.

19. A system comprising:

a source of therapeutic gas;

a bifurcated nasal cannula;

a therapeutic gas delivery device coupled to the source of therapeutic gas, and coupled to the bifurcated nasal cannula, the therapeutic gas delivery device comprising:

a controller;

a first sensor electrically coupled to the controller and configured to fluidly couple to first lumen of the bifurcated nasal cannula, the first sensor senses an attribute of airflow through the first lumen;

a first valve electrically coupled to the controller and configured to fluidly couple the source of therapeutic gas to the first lumen;

a second sensor electrically coupled to the controller and configured to fluidly couple to a second lumen of the bifurcated nasal cannula, the second sensor senses an attribute of airflow of the second lumen;

a second valve electrically coupled to the controller and configured to fluidly couple the source of therapeutic gas to the second lumen;

wherein the controller is configured to:

sense a current inhalation by way of the first sensor or the second sensor;

provide a flow of therapeutic gas to the first lumen of the bifurcated nasal cannula for a time duration determined based on a value indicative of previous inhalation duration.

20. The system of claim 19 wherein when the controller provides the flow of therapeutic gas, the controller is further configured to provide the flow based on a predetermined percentage of the value indicative of previous inhalation duration.

21. The system of claim 20 wherein when the controller provides the flow of therapeutic gas, the controller is further configured to provide the flow based for the time duration being sixty percent of the value indicative of previous inhalation duration.

22. The system of claim 20 wherein the controller is further configured to assign the value indicative of previous inhalation duration to be a duration of an immediately previous inhalation.

23. The system of claim 20 wherein the controller is further configured to assign the value indicative of previous inhalation duration to be an average duration of a plurality of previous inhalations.

24. The system of claim 20 wherein the controller is further configured to assign the value indicative of previous inhalation duration to be an average duration of three previous inhalations.

25. The system of claim 19 wherein the controller is further configured to, after the providing the flow, fill at least one lumen of the bifurcated nasal cannula with therapeutic gas prior to a subsequent inhalation.

26. The system of claim 25 wherein each lumen of the bifurcated nasal cannula defines a lumen volume, and wherein when the controller fills the at least one lumen of the bifurcated nasal cannula, the controller is configured to provide to the at least one lumen a fill volume that is within plus or minus ten percent (+/- 10%) of the lumen volume.

27. The system of claim 19 wherein the controller is further configured to determine, based on the first and second sensors, that the first lumen has a greater flow volume.

28. The system of claim 19 wherein the source of therapeutic gas is an oxygen concentrator.