CLAIMS

1. A breathing assistance apparatus comprising

a housing;

a source of breathable gas or gas~~s~~es;

a breathing conduit that conveys the breathable gas to a patient via a patient interface;

a touchscreen located on the housing;

a controller located within the housing to control the breathing assistance apparatus operations, including activation and operation of the breathing assistance apparatus,

wherein the controller is configured to:

- request the touchscreen to display a plurality of user health queries and a plurality of user input elements via which user inputs are received,
- refrain from activating or prevent activation of a component of the apparatus until a predetermined plurality of the user inputs have been received.

~~2. An apparatus of claim 1 wherein the controller is in electrical communication with the touchscreen and comprises an electronic processor and a memory in communication with the electronic processor, the controller controlling activation and operation of the apparatus.~~

~~3. An apparatus of claim 2 wherein the memory includes instructions executable by the electronic processor that when executed by the electronic processor cause the controller to~~

~~a) request the touchscreen to display a plurality of user queries and a plurality of user input elements via which user inputs are received,~~

~~b) refrain from activating or prevent activation of a component of the apparatus until a predetermined plurality of the user inputs have been received.~~

~~4.~~2. ~~An~~ The apparatus of ~~any one of claims 1-3~~claim 1 comprising a flow generator, a humidifier located within the housing downstream of and in fluid communication with ~~a~~ the flow generator and upstream of and in fluid communication with a fluid outlet, the humidifier including a heater plate, and wherein the controller is in electrical communication with, to control the activation and operation of, the flow generator and the heater plate.

3. The apparatus of claim 2, wherein the controller is configured to request the touchscreen to display a page after the controller receives the user inputs, the page presents a menu to control or activate the flow generator or the humidifier or to input an operational parameter of the flow generator or the humidifier.

4. The apparatus of any one of claims 1-3, wherein the controller is configured to request the touchscreen to display the user health queries and the plurality of user input elements such that at least one of the user health queries or at least one of the plurality of user input elements is different

between at least two instances of a or the flow generator being activated over a predetermined time period.

5. ~~An~~ The apparatus of any one of claims 1-4 comprising a network interface, located in the housing and in electrical communication with the controller, to send the predetermined plurality of the user inputs to an external or remote service or platform.

~~6. The apparatus of any one of claims 1-5, further comprising:~~

~~a power switch coupled to the controller and that switches between an on-mode and an off-mode, the breathing assistance apparatus is activated based on the power switch switching from the off-mode to the on-mode.~~

~~7. The apparatus of claim 6, wherein the power switch is a button, a knob, a dial, a rocker, a toggle, or a lever.~~

~~8.~~6. The apparatus of ~~any one of~~ claim~~s 5-7~~ 5, wherein the ~~instructions cause the~~ controller is configured to request the network interface to send the predetermined plurality of user inputs to server patient and device management platform one-by-one after each of the user inputs is received via the controller.

~~9. The apparatus of any one of claims 5-7, wherein the instructions cause the controller to request the network interface to send the predetermined plurality of user inputs to the patient and device management platform after all of the user inputs are received via the controller.~~

~~10.~~7. The apparatus of ~~any one of~~ claim 6~~s 5-9~~, wherein ~~the instructions cause~~ the controller is configured to request the network interface to send the predetermined plurality of user inputs to the patient and device management platform on a group-basis after a group of the user inputs is received via the controller.

~~11. The apparatus of any one of claims 1-10, wherein at least one of the user input elements is included in a group of user input elements corresponding to at least one of the user queries.~~

~~12. The apparatus of any one of claims 1-11, wherein the group of user input elements includes at least two user input elements that are visually distinct from each other.~~

~~13. The apparatus of claim 12, wherein the at least two user input elements are visually distinct from each other based on color.~~

~~14. The apparatus of claim 12, wherein the at least two user input elements are visually distinct from each other based on a shade of color.~~

~~15. The apparatus of any one of claims12-14, wherein the at least two user input elements are visually distinct from each other based on shape.~~

~~16. The apparatus of any one of claims 12-15, wherein the at least two user input elements are visually distinct from each other based on size.~~

~~17. The apparatus of any one of claims 12-16, wherein the group of user input elements ranges between 2 and 9.~~

~~18. The apparatus of any one of claims 12-17, wherein the group of user input elements includes a group of text strings.~~

~~19. The apparatus of any one of claims 12-18, wherein the group of user input elements includes a group of graphics.~~

~~20. The apparatus of claim 19, wherein at least one member of the group of graphics has an alphanumeric content extending at least one of therein or thereon.~~

~~21. The apparatus of claim 19 or 20, wherein at least one member of the group of graphics corresponds to an alphanumeric content other than the user health queries, the alphanumeric content is positioned external to the at least one member.~~

~~22. The apparatus of any one of claims 1-21, wherein at least one of the user health queries includes a concluding query mark.~~

~~23. The apparatus of any one of claims 1-22, wherein the user interface includes a plurality of pages on which the user queries and the user input elements are distributed.~~

~~24. The apparatus of any one of claims 1-23, wherein the user interface includes a page presenting the user health queries and the user input elements.~~

~~25. The apparatus of any one of claims 1-24, wherein the instructions cause the controller to repeatedly request the touchscreen to display the user health queries and the user input elements over a period of at least two consecutive days.~~

~~26.~~8. The apparatus of claim ~~1-25~~6 or claim 7, wherein the network interface is configured to receive~~s~~ a message from the patient and device management platform, the message is based on the predetermined plurality of the user inputs sent to the patient and device management platform via the network interface.

~~27.~~9. The apparatus of claim 8~~26~~, wherein the message includes a video content for output via the touchscreen.

~~28. The apparatus of claim 26, wherein the housing houses a speaker, the message includes an audio content for output via the speaker.~~

~~29.~~10. The apparatus of claim 8 or claim 9~~26~~, wherein the network interface is a first network interface, the message is a first message, the housing having a second network interface that sends a second message to a computing device responsive to the first message, the second message is associated with the predetermined plurality of user inputs sent to the patient and device management platform via the first network interface, the second network interface local to the computing device, the computing device is other than the patient and device management platform.

~~30.~~11. The apparatus of claim ~~26~~8 or claim 9, wherein the message is informative of a user health parameter worsening over a predetermined time period as determined based on at least one of the predetermined plurality of the user inputs.

~~31. The apparatus of claim 30, wherein the predetermined time period is at least two days.~~

~~32.~~12. The apparatus of claim ~~30~~11, wherein the message is informative of the user health parameter worsening relative to a baseline.

~~33.~~13. The apparatus of claim ~~30~~11, wherein the message is informative that two or more health parameters are worsening for at least two days and the patient is therefore deteriorating.

14. The apparatus of any one of claims 8-13, wherein the controller is configured to allow skipping the user health queries before activating a or the flow generator, as the component of the apparatus, such that the user health queries that are skipped form a plurality of data points that are sent to the patient and device management platform via the network interface.

~~34. The apparatus of any one of claims 1 to 33 wherein the query includes health queries.~~

~~35. The apparatus of any one of claims 32 to 34, wherein at least one of the user input elements is included in a group of user input elements corresponding to at least one of the user health queries, wherein the group of user input elements includes an odd number of user input elements, wherein the baseline is associated with a median user input element from the odd number of user input elements.~~

~~36. The apparatus of claim 33, wherein at least one of the user input elements is included in a group of user input elements corresponding to at least one of the user health queries, wherein the group of user input elements includes an odd number of user input elements, wherein the baseline is associated with a non-median user input element from the odd number of user input elements.~~

~~37. The apparatus of claim 33, wherein at least one of the user input elements is included in a group of user input elements corresponding to at least one of the user health queries, wherein the~~

~~group of user input elements includes an even number of user input elements, wherein the baseline is associated with a user input element from the even number of user input elements.~~

~~38. The apparatus of any one of claims 1-37, wherein at least one of the user input elements is included in a group of user input elements corresponding to at least one of the user health queries, wherein the group of user input elements includes a first input element that denotes a current position or a non-change state of the health parameter, a second input element that denotes an improvement in the health parameter, and a third user input element that denotes a deterioration of the health parameter.~~

~~39. The apparatus of any one of claims 1-38, wherein at least one of the user input elements is a member of a pair of user input elements corresponding to at least one of the user health queries, wherein the pair of user input elements corresponds to a pair of user inputs that are associated with a pair of data points that are mutually exclusive to each other, wherein the user inputs include at least one member of the pair of user inputs.~~

~~40. The apparatus of any one of claims 1-39, wherein the instructions cause the controller to prevent or preclude skipping the user health queries before activating the flow generator.~~

~~41. The apparatus of any one of claims 1-40, wherein the instructions cause the controller to allow skipping the user health queries before activating the flow generator.~~

~~42. The apparatus of any one of claims 1-41, wherein the instructions cause the controller to request the touchscreen to display a page after the controller receives the user inputs, the page presents a menu to control or activate the flow generator or the humidifier or to input an operational parameter of the flow generator or the humidifier.~~

~~43. The apparatus of any one of claims 1-42, wherein the instructions cause the controller to request the touchscreen to display the user health queries and the user input elements such that at least one of the user health queries or at least one of the user input elements is different between at least two instances of the flow generator being activated over a predetermined time period.~~

~~44. The apparatus of claim 43, wherein the predetermined period is at least two days.~~

~~45.~~15. The apparatus of any one of claims 1-~~44~~14, wherein the user health queries include a first query and a second query, wherein the first query precedes the second query, wherein the user inputs include a first user input and a second user input, wherein the first user input precedes the second user input, wherein the first user input corresponds to the first query, wherein the second user input corresponds to the second query, wherein the second query is content-dependent on the first user input.

~~46.~~16. The apparatus of claim ~~45~~15, wherein the first user input and the second user input are from a same user session.

~~47.~~17. The apparatus of claim ~~45~~15, wherein the first user input is from a first user session, wherein the second user input is from a second user session, wherein the first user session precedes the second user session.

~~48. The apparatus of any one of claims 1-47, wherein the controller receives the predetermined plurality of user inputs before the heater reaches a predetermined temperature.~~

~~49. The apparatus of any one of claims 1-48, wherein the user health queries and the user input elements are displayed upon booting of the controller.~~

~~50. The apparatus of any one of claims 1-49, wherein the controller refrains from activating the flow generator.~~

~~51. The apparatus of claim 50, wherein the controller refrains from activating the flow generator upon booting of the controller.~~

~~52.~~18. The apparatus of any one of claims 1-~~51~~17, wherein the controller prevents activation of the or a flow generator, as the component of the apparatus, until a predetermined plurality of the user inputs have been received.

~~53. The apparatus of claim 52, wherein the controller prevents activation of the flow generator upon booting of the controller.~~

~~54. The apparatus of any one of claims 1-53, wherein the predetermined plurality of the user inputs is all of the user inputs.~~

~~55.~~19. The apparatus of any one of claims 1-~~54~~18, wherein at least one of the user health queries relates a user disease progression or a user health condition.

~~56. The apparatus of any one of claims 1-55, wherein the instructions cause the controller to allow skipping the user health queries before activating the flow generator such that the user health that are skipped form a plurality of data points that are sent to the patient and device management platform via the network interface.~~

20. The apparatus of any one of claims 1-19, wherein at least two of the plurality of user input elements are visually distinct from each other based on shape and/or size and/or color and/or shade of color.

57. The apparatus of any one of claims 1-56, wherein the controller is configured request the touchscreen to display a plurality of user queries and a plurality of user input elements via which user inputs are received when the apparatus is in a warm up process, and/or a drying process.

58. A breathing assistance apparatus comprising:

a flow generator

a humidifier comprising a heater plate configured to heat the contents of the humidification chamber,

a breathing conduit that conveys the breathable gas to a patient via a patient interface;

a user I/O interface;

a controller to control the flow generator and humidifier,

wherein the controller is configured to present a health enquiry comprising one or more queries, when the apparatus is in a warm up process, and/or a drying process.

59. The breathing assistance apparatus of claim 58, wherein to present the health enquiry by displaying a plurality of user queries and a plurality of user input elements via which user inputs are received.

60. The breathing assistance apparatus of claim 58 or claim 59, wherein the apparatus is configured to activate the warm up process:

a) On startup of the apparatus, or

b) when the user is prompted to enter one or more operative parameters of the breathing assistance apparatus (optionally via a therapy control screen), or

c) when the user begins to enter one or more operative parameters of the breathing assistance apparatus (optionally via a therapy control screen), or

d) once the user has initiated therapy (optionally via a therapy control screen), or

e) when manually activated by a user.

61. The breathing assistance apparatus of any one of claims 59 to 60, wherein the warm up process comprises controlling the heater plate to specific temperature,

62. The breathing assistance apparatus of claim 61, wherein the specific temperature is based on one or more temperature set points of the apparatus (optionally the temperature set points are one or more operative parameters of the apparatus).

~~63. The breathing assistance apparatus of claim 61 or claim 62, wherein the specific temperature is about 35 degrees Celsius.~~

~~64. The breathing assistance apparatus of any one of claims 59 to 63, wherein the apparatus comprises a heater plate temperature sensor, and the controller controls the temperature of the heater until the heater plate temperature sensor reaches the specific temperature.~~

~~65. The breathing assistance apparatus of any one of claims 59 to 64, wherein the warm up process comprises controlling the heater plate of the breathing assistance apparatus to control a chamber outlet temperature to a specific temperature.~~

~~66. The breathing assistance apparatus of claim 65, wherein the chamber outlet is the outlet of a humidification chamber, and optionally measured in an elbow located after the chamber outlet of the humidification chamber.~~

~~67. The breathing assistance apparatus of any one of claims 64 to 66 wherein controlling the heater plate comprises controlling a power provided to the heater plate.~~

~~68. The breathing assistance apparatus of any one of claims 64 to 66, wherein the specific temperature is based on one or more temperature set points (optionally as one or more operative parameters of the apparatus for therapy) of the apparatus.~~

~~69. The breathing assistance apparatus of claim 68, wherein the specific temperature within about 5 degrees Celsius to about 15 degrees Celsius, or about 10 degrees Celsius, or optionally about 5 degrees Celsius to about 15 degrees Celsius, or about 10 degrees Celsius less than one or more temperature set points.~~

~~70. The breathing assistance apparatus of claim 68 or claim 69, wherein the one or more temperature set points is a desired dew point, or a desired patient end temperature.~~

~~71. The breathing assistance apparatus of any one of claims 68 to 70, wherein one or more temperature set points corresponds to a required relative humidity or a required absolute humidity, optionally the relative humidity is about 90% to about 100% or is about 100%.~~

~~72. The breathing assistance apparatus of any one of claims 59 to 71, wherein the warm up process comprises controlling a heater wire in a conduit attached to the apparatus configured to provide gases to a patient to control a temperature at the end of the conduit to an end of the conduit specific temperature.~~

73. The breathing assistance apparatus of claim 72, wherein the end of the conduit specific temperature is based on one or more temperature set points (optionally as one or more operative parameters of the apparatus for therapy) of the apparatus.

74. The breathing assistance apparatus of claim 73, wherein the one or more temperature set points is a desired dew point, or a desired patient end temperature.

75. The breathing assistance apparatus of claim 73 or 74, wherein the end of the conduit specific temperature is determined by the controller based on the selected one or more temperature set points that represents a desired humidity.

76. The breathing assistance apparatus of any one of claims 72 to 75, wherein the end of the conduit specific temperature is based on one or more temperature set points, and wherein the one or more temperature set points a desired patient end temperature.

77. The breathing assistance apparatus of claim 76, wherein the end of the conduit specific temperature is within about 2 degrees Celsius to about 5 degrees Celsius, or about 2.5 degrees Celsius of the desired patient end temperature, and optionally, about 2 degrees Celsius to about 5 degrees Celsius, or about 2.5 degrees Celsius less than the desired patient end temperature.

78. The breathing assistance apparatus of claim 77, the end of the conduit specific temperature is a predetermined temperature.

79. The breathing assistance apparatus of any one of claims 59 to 78, wherein the warm up process comprises the controller deactivating the flow generator.

80. The breathing assistance apparatus of any one of claims 59 to 79,, wherein the warm up process comprises running the flow generator at a predetermined flow rate or a predetermined flow generator output.

81. The breathing assistance apparatus of claim80, wherein the predetermined flow rate is lower than a therapeutic flow being provided to the patient.

82. The breathing assistance apparatus of claim 80, wherein the predetermined flow generator output is a motor speed about 1000RPM to about 3000RPM or less than about 2000RPM.

83. The breathing assistance apparatus of any one of claims 59 to 82, wherein the controller is configured to activate the drying process:

a) at the end of a therapy session, or

b) when manually activated by a user, or

c) when a standby process has been active for a predetermined amount of time.

84. The breathing assistance apparatus of claim 83, wherein a user indicates via the user I/O interface when the therapy session has ended

85. The breathing assistance apparatus of claim 83 or claim 84, wherein the end of therapy is determined by the detection that a user has taken off the patient interface (and optionally that a predetermined period of time has elapsed.)

86. The breathing assistance apparatus of any one of claims 59 to 85, wherein the drying process comprises controlling a heater wire in the breathing conduit while the flow generator provides gases as a set flow rate.

87. The breathing assistance apparatus of any one of claims 59 to 86, wherein the drying process comprises controlling a heater plate of the humidifier to a predetermined value, or the heater plate may be deactivated during the drying process.

88. The breathing assistance apparatus of any one of claims 59 to 87, wherein the heater wire is controlled by the controller to a predetermined temperature at the end of the patient breathing conduit, or controlled to a predetermined duty cycle or to a predetermined power.

89. The breathing assistance apparatus of claim 88, wherein the predetermined duty cycle is 100%.

90. The breathing assistance apparatus of claim 88 or claim 89, wherein the predetermined temperature is greater than 45 degrees Celsius.

91. The breathing assistance apparatus of any one of claims 59 to 90, wherein the drying process is configured to operate for at about 20 minutes to about 40 minutes, or about 15 minutes.

92. The breathing assistance apparatus of any one of claims 59 to 91, wherein the drying process comprises controlling the flow generator to provide a predetermined flow generator output, wherein the flow generator output is a motor speed about 1000RPM to about 3000RPM or less than about 2000RPM.

93. The breathing assistance apparatus of any one of claims 59 to 92, wherein the drying process comprises controlling the flow generator to provide a predetermined flow rate, wherein the predetermined flow rate is about 10 litres/minute to about 20 litres/minute.

94. The breathing assistance apparatus of any one of claims 59 to 94, wherein the drying process is configured to evaporate remaining condensate in the apparatus and/or patient breathing conduit and/or patient interface.

95. The breathing assistance apparatus of any one of claims 59 to 94, wherein the controller is configured to refrain from activating or prevent activation of a component of the apparatus until a predetermined plurality of the user inputs have been received.

96. The breathing assistance apparatus of any one of claims 57 to 95, wherein the controller refrains from providing therapy until the user inputs have been received and/or the warm-up process is complete.

97. The breathing assistance apparatus of any one of claims 57 to 95,, wherein based on the answers to the user queries related to one or more health parameters and one or more historic answers to the user queries related to one or more health parameters the controller is configured to determine deterioration of patient health, wherein the deterioration of patient health is based on:

a worsening of two or more health parameters for at least two days (optionally from a baseline).

98. A breathing assistance apparatus comprising:

a flow generator

a breathing conduit that conveys the breathable gas to a patient via a patient interface;

a user I/O interface;

a controller to control the flow generator and humidifier,

wherein the controller is configured to display the health enquiry on the user I/O interface, the health enquiry comprising one or more user queries relating to one or more health parameters, wherein each query comprises a plurality of user input elements via which user inputs are received as answers to the user queries, and

wherein based on the answers to the user queries related to one or more health parameters and one or more historic answers to the user queries related to one or more health parameters the controller is configured to determine a deterioration of patient health,

wherein an deterioration of patient health is based on:

a worsening of two or more health parameters for at least two days (optionally from a baseline).

99. The breathing assistance apparatus of claim 98, wherein the one or more historic answers to the user queries relating to one or more health parameters are stored locally on the apparatus and/or on a patient and device management platform.

100. The breathing assistance apparatus of any claim 98 or claim 99, wherein the apparatus and/or a or the patient and device management platform is configured to notify a user if the deterioration of patient health is determined.

~~101. The breathing assistance apparatus of any one of claim 98 to claim 100, wherein the deterioration of patient health is additionally based on: a worsening in one or more patient parameter (optionally from a baseline).~~

~~102. The breathing assistance apparatus of claim 101, wherein the patient parameter is one or more of: a patient oxygen saturation (optionally measured by at least one patient sensor) and/or a patient respiratory rate (optionally determined from a flow signal from a flow sensor).~~

~~103. The breathing assistance apparatus of claim 101 or claim 102, wherein the patient parameter is measured by at least one patient sensor.~~

~~104. The breathing assistance apparatus of any one of claim 98 to 103, wherein the health enquiry comprises one or more queries related to a COPD condition, and/or one or more queries related to a bronchiectasis condition.~~

~~105. The breathing assistance apparatus of claim 104, wherein the queries of the health enquiry are ordered such that queries related to a COPD condition are displayed first, followed by queries related to a bronchiectasis condition.~~

~~106. The breathing assistance apparatus of claim 104 or 105, wherein general health queries are presented before queries related to a COPD condition and queries related to a bronchiectasis condition.~~

~~107. The breathing assistance apparatus of any one of claims 98 to 106, wherein the apparatus comprises a humidifier comprising a heater plate configured to heat the contents of the humidification chamber.~~

~~108. The breathing assistance apparatus of any one of claims 98 to 107, wherein the user I/O is a touchscreen, and the touchscreen is at least 3.5 inches in diagonal measurement, or at least 4 inches in diagonal measurement, or 4.2 inches in diagonal measurement.~~

~~109. The breathing assistance apparatus of any one of claims 98 to 108, wherein the health enquiry is displayed at the beginning of therapy and/or the end of therapy.~~

~~110. The breathing assistance apparatus of any one of claims 98 to 109, wherein the controller is configured display the health enquiry when the apparatus is in a warm up process, and/or a drying process.~~