



SentrySuite™

software platform for intelligent respiratory diagnostics

SentrySuite™ 360° – one screen, all in

Quick change to different levels like Pre, Post, etc.

Clear overview about applied medication

Quickly view, print or store reports

Direct access to calibration programs

Available in 17 languages

Switch into Edit Mode



Automated interpretation with a choice of different authors

All test results in one adjustable table

Color-coded classification bar or grading

All important graphs in one view

Ease-of-use measurement concept

Keep the overview without switching programs. All **important steps**; calibration, patient data entry, measurements, interpretation and reporting can be navigated **within ONE screen**.

Easily switch between measurement programs

Detailed information about quality and repeatability of the test according to ATS/ERS

Quick patient data access

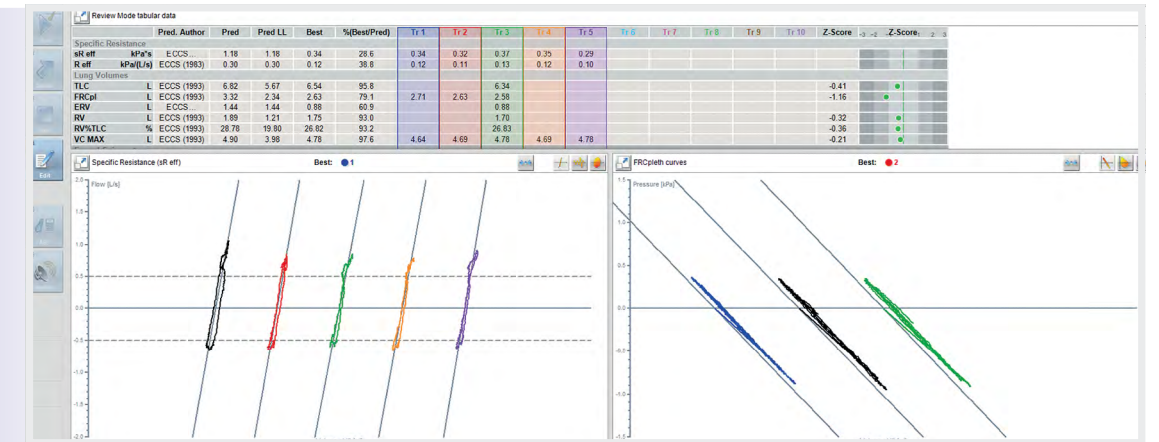
SentrySuite™ supports a comprehensive list of PFT and CPET measurements



Whether the **MasterScreen™** series or the new **Vyntus™** series, they are all **powered by SentrySuite** – from small PC spirometers to high-end PFT to ECG and CPET devices.

All PFT measurement programs show the same graph and table arrangement with **a consistent user interface**. **Intuitive operation** and **quick learning** of new measurements are guaranteed.

Body Plethysmography



CO Diffusion SB Real-time



Measurement capabilities:

Slow Spirometry

Forced Spirometry

MVV

Bronchial Challenge Testing

Body Plethysmography

FRC N₂ Washout

FRC HE Rebreathing

SB Diffusion Real-time

SB Diffusion Intrabreath

NO Diffusion

Rocc

Impulse Oscillometry (IOS)

Rhinomanometry

PO.1

MIP/MEP

SNIP

Compliance

Resting ECG

Stress ECG

CPET breath-by-breath

CPET mixing chamber

CPET High/Low FIO₂

REE Canopy

Guidance and Quality

Coaching for operator and patient

Body Plethysmography

- FRCpleth criteria met
- FRCpleth notification for reproducibility
- Colored stability bar for VT, BF, sRaw and FRCpleth during body plethysmography

Forced Spirometry

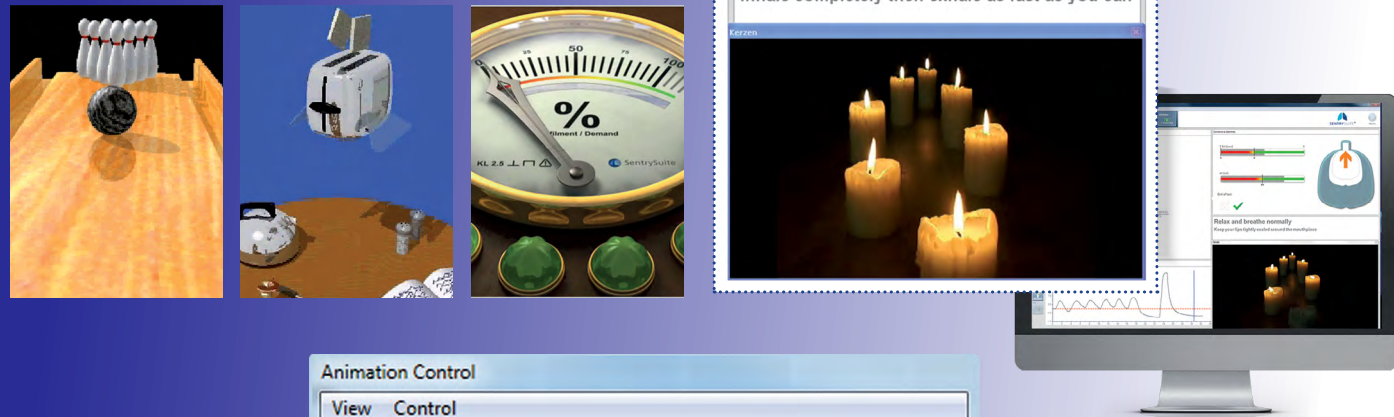
- Check marks for spirometry end-of-forced-expiration criteria
- Relax and breathe normally. Keep your lips tightly sealed around the mouthpiece.
- Online breathing curves
- Colored guidance bar for in-test exhalation time and plateau recognition

CO Diffusion SB Realtime

- Breath-hold timer and mouth pressure control
- Hold breath. Please exhale when shutter opens.
- Online textual guidance ideal for new personnel

Animation incentives

Choose from 10 different patient animations for forced spirometry.



Adjust the target scale to your patient needs.

SentrySuite™ Quality Assurance—approved results

SentrySuite offers many tools to approve the quality and accuracy of your measurements.

With **SentrySuite Quality Management** you can validate your measurement device using calibrated syringes, FRCpleth or DLCO simulators. Pre-defined special SeS QM patients automatically switch-off BTPS compensation and correct appropriately for mechanical dead space.

Type of Patient

- Patient
- Demo Patient
- BIO QC
- SeS QM validation

SentrySuite supports biologic control testing with a separate **BIO QC database**. The BIO QC data is easily identified and separated out for trending and further analysis. According to the ATS/ERS guidelines, tests should be performed on a "standard subject".

After each trial, SentrySuite provides feedback on the **acceptability** and **repeatability** of the measurement, checking the results against the **ATS/ERS guidelines** or other defined standards.

- ATS/ERS Spirometry Guidelines 2019
- ATS/ERS Diffusion Guidelines 2017
- ATS/ERS Reporting Guidelines 2017

Quality Grade FVC ATS 2019	Quality Grade FEV1 ATS 2019
A	A
B	B
C	C
D	D
E	E
F	F
G	G
H	H
I	I
J	J
K	K
L	L
M	M
N	N
O	O
P	P
Q	Q
R	R
S	S
T	T
U	U
V	V
W	W
X	X
Y	Y
Z	Z



Networking

The united data of SentrySuite™

Devices powered by SentrySuite Software



CITRIX



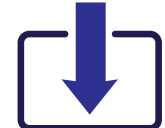
Physician's review workplace

Use your existing network environments: client-based, web-based, Citrix.

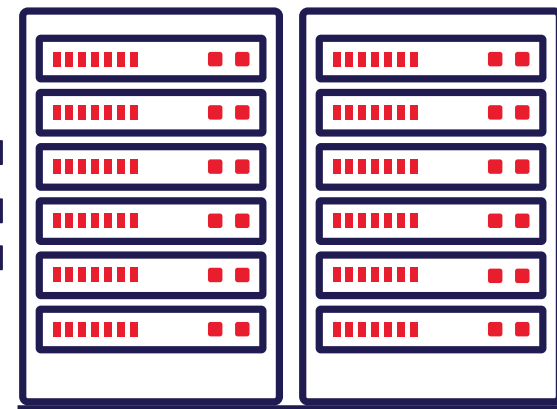
Upgrade SentrySuite devices

Upgrade supported MasterScreen devices to run with latest SentrySuite Software.

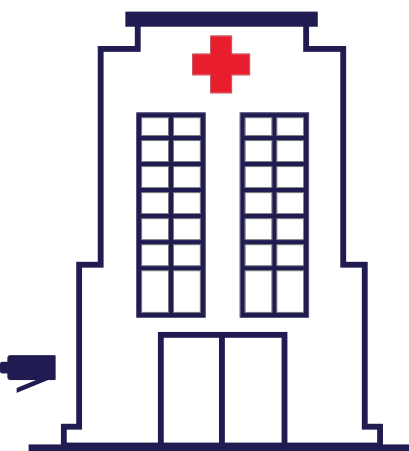
Non-Vyaire data import



SentrySuite™ SQL Server



Hospital Information System



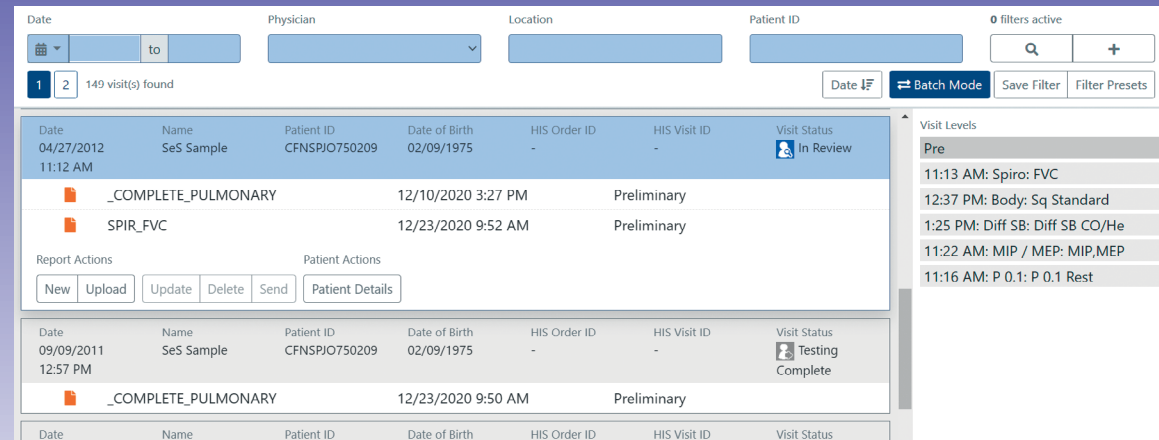
One central patient database, so many advantages:

- One-time patient data entry saves time
- Several measurements from different devices on **one** single report
- Measure **spirometry one time only** and use it for further measurements like SB Diffusion or CPET
- Avoid duplication of effort** – changes or creation of new reports, layouts, predicted sets are globally deployed
- Automatic backup** secures important patient data

Connect your cardiopulmonary lab with your HIS using SentryConnect™

- The powerful interoperability solution. Create your individual solution. Our **experienced IT specialists** are there for you every step of the way.
- Easily **retrieve patient data from your HIS and send back** the measurement results
- HL7** messaging with discrete data and **pdf** graphics providing full visual reporting to clinicians
- Use **orders with worklists**
- Modules for advanced tasks like **billing**
- GDT interface for praxis systems

Save time with the workflow driven physician's review tool



Review Tool

A standard with SentrySuite™

- **Ultra-fast report view** with results on the left and interpretation on the right
- Customized interpretation templates and macros
- **Electronic signature**
- Automated Send-To-HIS functionality
- Status management
- Also available as **web-based solution** named **SentrySuite Mobile Review**

Artificial Intelligence meets PFT interpretation

Seamless workflow integration

ArtiQ.PFT fully automates the interpretation of pulmonary function tests and provides AI-based disease probabilities to support diagnosis. Allowing pulmonologists to focus on clinical decision making and patient consultation.

- spend your time wisely
- boost consistency
- maximize your diagnostic accuracy
- define your next steps



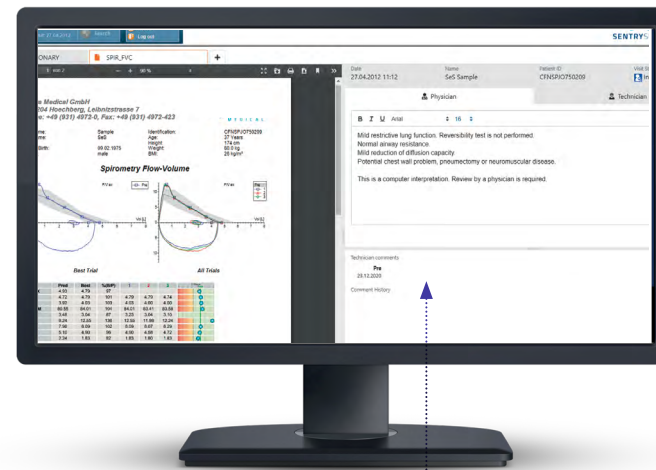
With SentrySuite™, technician and physician work hand in hand

The technician performs the measurement and saves the proper report.

The physician sees all visits with their associated reports for interpretation.

Flexible workflow status design allows for optional steps such as a preliminary interpretation by a fellow, with subsequent confirmation or revision by the attending physician.

Apply filters to create individual work lists.

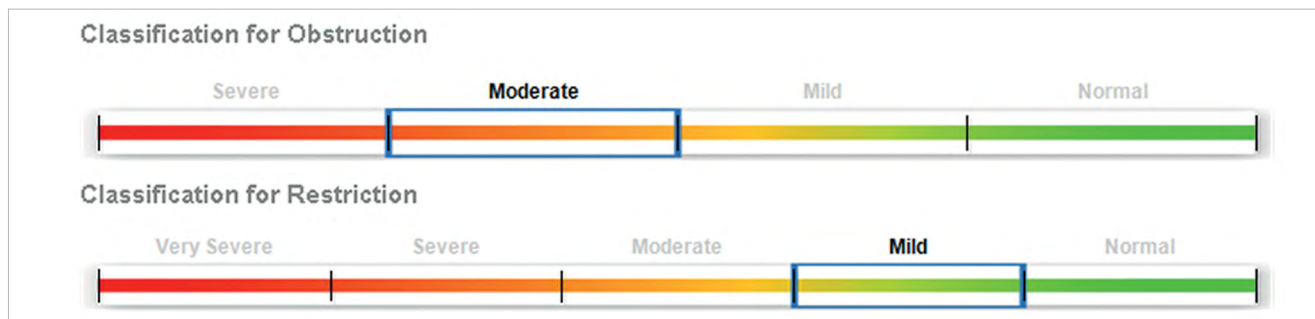


Tools go hand in hand with the workflow

	Pred Auth	Pred	Pred LL	Best	%(Best/Pred)	Tr 1	Tr 2	Tr 3	Z-Score	Z-Score
FVC	L	Quanjer GLI (2012)	5.06	4.05	4.84	96	4.84	4.78	4.68	-0.37
FEV 1	L	Quanjer GLI (2012)	4.13	3.28	4.07	98	4.07	4.02	3.97	-0.12
FEV 1 % FVC	%	Quanjer GLI (2012)	81.86	71.28	84.15		84.15	84.10	84.82	0.40
PEF	L/s	ECCS (1993)	9.33	7.34	11.09	119	11.09	10.87	10.53	1.46
MFEF 75/25	L/s	Quanjer GLI (2012)	4.14	2.48	4.26	103	4.26	4.23	4.18	0.10
Quality Grade FVC ATS 2019					A					
Quality Grade FEV1 ATS 2019					A					

Scoring

SentrySuite offers all important parameter related scores; %Predicted, Lower Limit, Upper Limit, Z-Score, Standard Deviation



Classification

Each measurement program shows a classification bar indicating the possible limitation

SeS Sample, a 42 years old male patient, was referred to this laboratory for evaluation dyspnoea. Spirometry data is ACCEPTABLE and REPRODUCIBLE.

The measured FEV1 was 3.99 L, 102.57 % to reference value GLI.
The Forced Vital Capacity FVC was 4.72 L, 100.55 % reference value GLI.
The Airway Resistance with 0.12 kPa/(L/s) is within normal limits of < 0.3.

Interpretation Templates

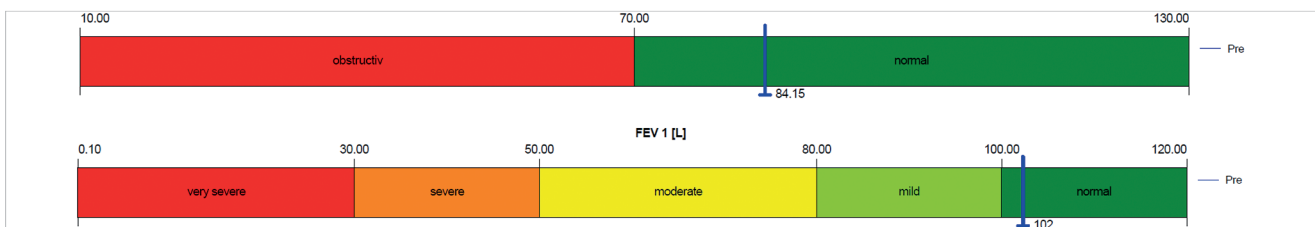
Create your own templates with macros

Interpretation of visit: Intermountain Thoracic Society (1984)

This combination of findings is consistent with the following: Moderate Chest Restriction is indicated by the reduced TLC. The Diffusing Capacity (DLCO) is Moderately Reduced. The DLCO (corrected)/VA is reduced. The reduced DLCO may be caused by an altered gas exchanging surface. Spirometric results are within normal limits. This is a computer interpretation; review by a physician is required.

Automatic Interpretation

Several authors come standard: Ellis, Jaeger (1994), ATS/ERS 2005, Intermountain Thoracic Society (1984), Methodist Hospital (1994), IOS, CPET Eschenbacher/Mannina (1990), Fukuda Sangyo



Individual Bar Graphs

Create your own interpretation bar with the flexible Report Designer

Trending—monitor patient results over time



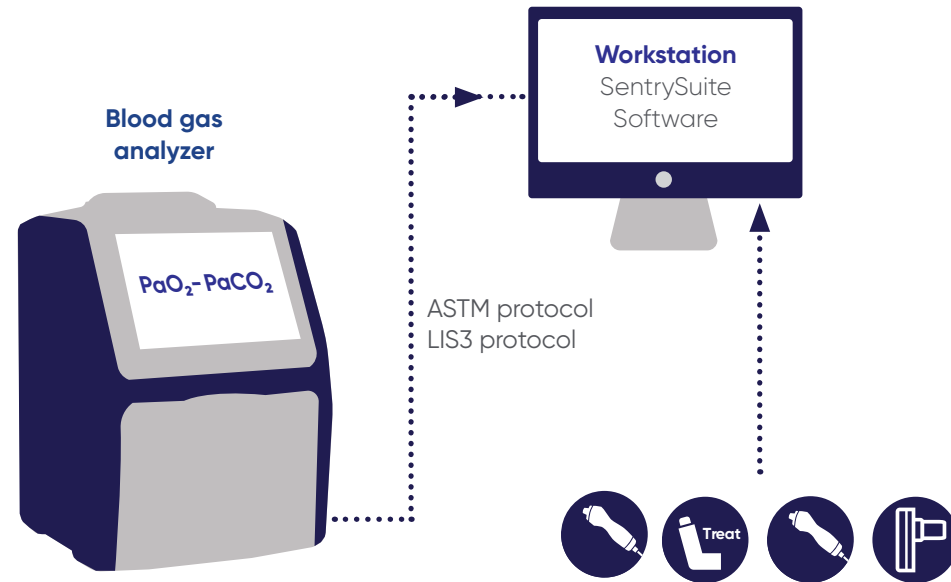
Measurement Parameter	Date	Time	Medication	Spiro FVC (L)	FEV1 (L)	MMEF (L/s)
	21.07.2010	16:26:28		4.85	4.07	3.81
	21.07.2010	16:32:53	Salbutamol	4.87	4.05	3.70
	25.01.2011	13:22:44		4.84	4.07	3.99
	09.09.2011	12:57:24		4.72	4.02	4.26
	27.04.2012	11:12:17		4.79	4.03	4.19
	13.04.2013	10:55:39		4.57	3.73	3.64
Mean value				4.77	3.99	3.93
Standard dev.				0.10	0.12	0.23
Var. coeff. [%]				2.13	2.94	5.96



Trending reports are standard in SentrySuite. Show your long term data with one click for any parameter.

Respiratory data transfer

Connect your Fenom Pro[®] and stand alone Vyaire spirometry devices with SentrySuite[™].



Blood gas online connection

Connect your blood gas analyzer with SentrySuite

- Automate import and storing of blood gas measurements into the SentrySuite patient data record
- PFT / CPET and blood gas results on one report ready for interpretation
- Supports many types of blood gas analyzers

Questionnaires

Digitally integrated into SentrySuite[™] – paperless and mobile solutions

Collect patient answers electronically and integrate them seamlessly into the SentrySuite database. The completed questionnaires are saved into the patient's database and can become part of your report. Choose from our standard questionnaires or create your own with the optional Questionnaire Designer with six different question types.

SentrySuite even brings scoring functionality to your questionnaires.

Tobacco smoking		Score
1 Have you ever smoked cigarettes? (NO means less than 20 packs of cigarettes or lifetime or less than 1 cigarette a day for 1 year.)		0
1 Yes		2
2 No		
2 Do you now smoke cigarettes (as of 1 month ago)?		3
1 Yes		
2 No		
3 Does not apply		
3 How old were you when you first started cigarette smoking? (-1 = Does not apply)		0
15	Age in Years	
4 How many cigarettes do you smoke per day now? (-1 = Does not apply)		0
20	Cigarettes/day	
5 Do or did you inhale the cigarette smoke?		2
1 Does not apply		
2 Not at all		
3 Slightly		
4 Moderate		
5 Deeply		

Thank you

Total score: 8

Offline data input

Offline data input – a standard in SentrySuite

Extend and feed your SentrySuite database with further external measurements like exhaled NO, lactate values and blood gases.

- 1 Create a new parameter set or use implemented parameter sets like blood gases
- 2 Type in and save your measurement results into the SentrySuite database
- 3 Interpret, view and print together with your PFT / CPET data on one common report

	Pred	Best	%(B/P)	1	2	3	-3	-2	Z-Score	2	3
Spirometry											
FVC	L	4.69	4.57	97	4.57	4.31	4.46				
FEV 1	L	3.89	3.73	96	3.73	3.54	3.71				
FEV 1 % VC MAX	%	80.37	81.67	102	81.67	77.38	81.17				
Exhaled NO											
NO	ppb	23									
Level date	13.04.13										
Level time	10:55										

Example of a spirometry report showing also an offline typed in Nitric Oxide measurement



Clinical research

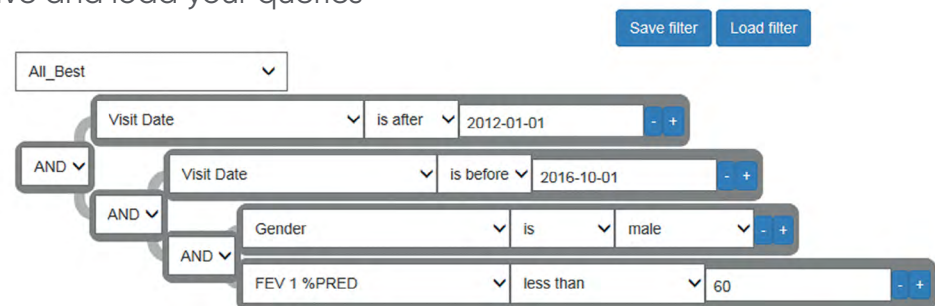
Sentry CIS DataCube

Access your lung function data for clinical research and statistics using the **Sentry CIS DataCube**

Define and deploy tailored research databases, based on SentrySuite patient demographics and visit data, standard questionnaires, predicted information and measurement parameters.

Easy **Query Builder** user interface

- Direct output into Microsoft Excel or others
- Profit from various table configurations
- Customize, save and load your queries



SentrySuite provides access to your patient data for clinical research.

From SentrySuite Query Builder to Excel Outcome

	A	B	C	D	E	F	G	H	I	GT	HC	HI	JK	JN	LA	LD	LJ	LY
1	Visit Date	Patient ID	Gender	Race	Test Date	Age	Height	Weight	LevelType	FEV 0.5	FEV 1	FEV 1 % FVC	FVC	FVC in	MEF 25	MEF 50	MEF 75	MFEF 75/25
4	27.11.2014	GAB10031963	male	Caucasian	27.11.2014	51	1.74	90	1	3,492	4,255	83,613	5,089	5,484	1,137	4,788	11,253	4,643
5	13.04.2013	CFNSPJ0750209	male	Caucasian	13.04.2013	38	1.74	80	1	3,129	3,986	84,485	4,718	4,691	1,974	4,819	8,318	4,179
6	27.04.2012	CFNSPJ0750209	male	Caucasian	27.04.2012	37	1.74	80	1	3,24	4,139	84,014	4,965	5,002	1,868	4,898	9,183	4,188
7	09.09.2011	CFNSPJ0750209	male	Caucasian	12.09.2011	36	1.74	80	1	3,145	4,024	85,226	4,721	4,766	2,015	4,785	8,101	4,339
8	25.01.2011	CFNSPJ0750209	male	Caucasian	25.01.2011	36	1.74	80	5	2,984	3,779	91,57	4,127	3,408	5,183	7,748	4,733	
9	25.01.2011	CFNSPJ0750209	male	Caucasian	25.01.2011	36	1.74	80	5	3,022	3,873	91,855	4,216	3,622	2,642	5,196	7,761	4,748
10	25.01.2011	CFNSPJ0750209	male	Caucasian	25.01.2011	36	1.74	80	5	1,424	1,848	91,439	2,021	1,399	1,2	2,424	3,628	2,276
11	25.01.2011	CFNSPJ0750209	male	Caucasian	25.01.2011	36	1.74	80	6	3,041	3,911	82,642	4,732	4,485	1,74	4,502	7,489	3,997
12	25.01.2011	CFNSPJ0750209	male	Caucasian	25.01.2011	36	1.74	80	5	2,702	3,918	91,721	3,681	2,958	2,351	4,986	7,813	3,518
13	25.01.2011	CFNSPJ0750209	male	Caucasian	25.01.2011	36	1.74	80	5	2,702	3,918	91,721	3,681	2,958	2,351	4,986	7,813	3,518



SentrySuite™ Cyber-security

SentrySuite software protects you against cybersecurity threats by implementing a whole set of technical safeguards.

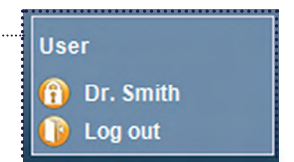
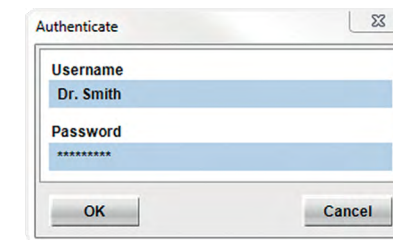
Data security and access control are the keys to protecting health information. SentrySuite offers several security features and comprehensive user administration.

Three steps to secure your patient data:



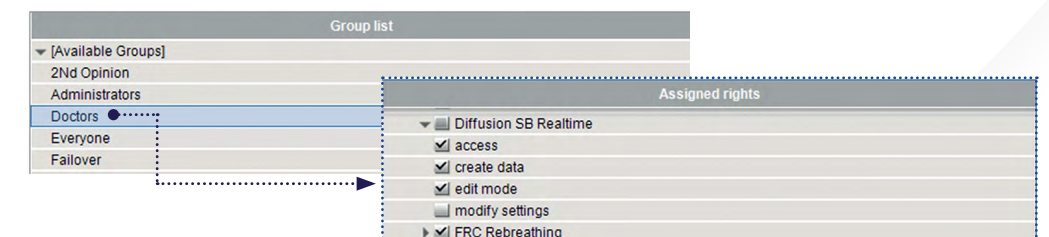
1. AUTHENTICATION

SentrySuite offers **comprehensive settings** for your password protection including the use of Single Sign On and Active Directory linking through LDAP.



2. AUTHORIZATION

The SentrySuite program **User Administration** allows easy to **create user and user groups** with their **assigned rights**. Make sure that only authorized users have access to the different sub programs.



3. AUDIT


The program **Log File Viewer** reports all proceeded steps within the SentrySuite Software with their appropriate user.

Date Time	User name	Workstation ID	Site	Event ID	Event text	Application
2017-02-14 10:59:26.070	Dr. Smith	LWDEU073XL56R1	n/a	4021	Startup program	Bodyplethysmography
2017-02-14 10:59:25.250	n/a	LWDEU073XL56R1	n/a	4013	Dr. Smith	Session Manager
2017-02-14 10:59:24.090	Dr. Smith	LWDEU073XL56R1	n/a	4021	Exit program	Spirometry
2017-02-14 10:20:25.880	Dr. Smith	LWDEU073XL56R1	n/a	4021	Startup program	Spirometry
2017-02-14 10:20:25.150	n/a	LWDEU073XL56R1	n/a	4013	Dr. Smith	Session Manager
2017-02-14 10:20:23.800	n/a	LWDEU073XL56R1	n/a	4021	Starting Application 'Spirometry'	SentryDesktop
2017-02-14 10:20:14.030	n/a	LWDEU073XL56R1	n/a	1000	Run Automatic: Completed Task 'Start up database'	SentryDesktop

GLOBAL HEADQUARTERS


Vyaire Medical, Inc.
26125 N. Riverwoods Blvd.
Mettawa, IL 60045
USA

ARTIQ.PFT

 ArtiQ NV
Boskouter 15
3010 Kessel-Lo
Belgium




SENTRYSUITE™ SOFTWARE

 Vyaire Medical GmbH
Leibnizstrasse 7
97204 Hoechberg
Germany



FENOM PRO®

 CAIRE Diagnostics Inc.
7020 Koll Center Pkwy,
Suite 110
Pleasanton, CA 94566-3107
USA



QAdvis EAR AB
Ideon Science Park
Scheelevagen 17
SE-223 Lund, Sweden

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