



ComPAS SQL Build 1458 Change List Issued – 04/30/2008

#	Feature	Description	Engineer/Tester
1	User-selection of IC	The ability for the technician to right-click and select an individual IC effort from the columns of SVC tests. The SVC and IC can be individually selected resulting in a computed ERV.	PS/RB
2	Dynamic (Auto-scaling)	During run-time tests of FVC, SVC, MVV and DLCO the graph scale can be set to either “Dynamic” or “Fixed”. For dynamic scaling to work appropriately on FVC and SVC, at least 2 tidal breaths must be completed on the efforts. The scaling keeps the 2:1 ratio of flow to volume using whichever is the greater in scale: Actual PEFR or Predicted PEFR.	PS/RB
3	DLCO Expiratory Time-out	During the collection phase of the DLCO test, the automatic valve time-out has been increased from 3 to 6 seconds. This improves sample gas collection in cases of extreme low flow.	PS/PFM
4	Expanded Administrative Reports	New reports have been added to list physician/patient activity for purposes of billing records.	SRM/PFM
5	Super Predicted Calculator	A new utility allows for back-calculation of all stored tests using the current predicted equation set.	SRM/PFM
6	Connection Monitor	Improved network connectivity. Added ability to recover from minor connectivity issues.	MF/MF
7	Flow Volume Loop Resolution	Flow Volume loop resolution is now 10ml increments.	PS/RB
8	% Predicted Graphing	% Predicted has been added to the ‘instant’ serial data graph presented in Patient Biographical, Run-time Testing and Task Manager. An improved graphic design will be available in the next release.	SRM/PFM
9	Box Pressure Zero Offset	Changes in the Medisoft box electronics set-up required that we now read Box Pressure Zero with the door closed and Vent Open to achieve the auto-venting routine.	PS/PFM

ComPAS SQL Builds 1459-1466 Internal Development and Testing



ComPAS SQL Build 1467 Change List Issued – 05/30/2008

#	Feature	Description	Engineer/Tester
1	User-selection of IC	The ability for the technician to right-click and select an individual IC effort from the columns of SVC tests. The SVC and IC can be individually selected resulting in a computed ERV.	PS/RB
2	Dynamic (Auto-scaling)	During run-time tests of FVC, SVC, MVV and DLCO the graph scale can be set to either “Dynamic” or “Fixed”. For dynamic scaling to work appropriately on FVC and SVC, at least 2 tidal breaths must be completed on the efforts. The scaling keeps the 2:1 ratio of flow to volume using whichever is the greater in scale: Actual PEFR or Predicted PEFR.	PS/RB
3	DLCO Expiratory Time-out	During the collection phase of the DLCO test, the automatic valve time-out has been increased from 3 to 6 seconds. This improves sample gas collection in cases of extreme low flow.	PS/PFM
4	Expanded Administrative Reports	New reports have been added to list physician/patient activity for purposes of billing records.	SRM/PFM
5	Super Predicted Calculator	A new utility allows for back-calculation of all stored tests using the current predicted equation set.	SRM/PFM
6	Connection Monitor	Improved network connectivity. Added ability to recover from minor connectivity issues.	MF/MF
7	Flow Volume Loop Resolution	Flow Volume loop resolution is now 10ml increments.	PS/RB
8	% Predicted Graphing	% Predicted has been added to the ‘instant’ serial data graph presented in Patient Biographical, Run-time Testing and Task Manager. An improved graphic design will be available in the next release.	SRM/PFM
9	Box Pressure Zero Offset	Changes in the Medisoft box electronics set-up require that we now read Box Pressure Zero with the door closed and Vent Open to achieve the auto-venting routine.	PS/PFM
10	Technician Notes	Correction to prevent notes from a previous patient populating the next sequential patient viewed in the Task Manager.	MF

ComPAS SQL Builds 1468-1483 Internal Development and Testing



ComPAS SQL Build 1484 Change List Issued – 10/01/2008

#	Feature	Description	Engineer/Tester																				
1	Updated Standardized Predicted Equation Sets	<p>New Predicted Sets include:</p> <table border="1"> <tr><td>Spirometry</td><td>DLCO</td></tr> <tr><td>Collins1</td><td>Gaensler</td></tr> <tr><td>Intermountain</td><td>Burrows</td></tr> <tr><td>NHANES III</td><td>Rosenthal & Cotes</td></tr> </table> <p>Revised Predicted Sets include:</p> <table border="1"> <tr><td>Spirometry</td><td>DLCO</td></tr> <tr><td>Intermountain</td><td>Crapo</td></tr> <tr><td>Intermountain</td><td>Miller</td></tr> <tr><td>Knudson</td><td>Cotes</td></tr> <tr><td>Knudson</td><td>Miller</td></tr> <tr><td>ERS</td><td>Cotes</td></tr> </table>	Spirometry	DLCO	Collins1	Gaensler	Intermountain	Burrows	NHANES III	Rosenthal & Cotes	Spirometry	DLCO	Intermountain	Crapo	Intermountain	Miller	Knudson	Cotes	Knudson	Miller	ERS	Cotes	PFM/RS
Spirometry	DLCO																						
Collins1	Gaensler																						
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NHANES III	Rosenthal & Cotes																						
Spirometry	DLCO																						
Intermountain	Crapo																						
Intermountain	Miller																						
Knudson	Cotes																						
Knudson	Miller																						
ERS	Cotes																						
2	Updated BTPS Script	Minor change to the BTPS Script	PS/PFM																				
3	Hans Rudolph DLCO Simulator	DLCO Script has been changed so that customers using the DLCO Simulator have data presented in the order and gas format required by the EasyLab QC Software. The “Syringe” icon in DLCO now assumes you are using the Simulator and modifies the “DLCO Worksheet” accordingly	PS/PFM																				
4	QC Reporting for the TransAir2	Quality Control reporting has been added for the TransAir2 PFT system	SRM/PFM																				
5	New Device Flag	New Device Configuration for the Morgan X1	PS/MF																				
6	Revised Helium FRC Editor	An improved utility has been developed for technician adjustment of the FRC baseline, IC and VC at the conclusion of a helium FRC test.	PS/PFM																				
7	Vacuum Checking on TransAir2	A secondary check of vacuum status for the emptying of the expiratory bag prior to DLCO testing has been added for TransAir2 devices.	PS/RDS																				
8	Task Manager Multi-Select	Ability to multi-select tests for Re-assignment of Attending Physician	MF/PFM																				
9	Storage of gas analyzer curves in DLCO testing	Analysis of the expired and inspired gas samples is stored and displayed for improved troubleshooting.	PS/RMS																				
10	Volume-Time Graphics storage	A change has been made to the volume-time graphics storage to record data out to the end of test. Former storage halted volume-time graphic recording at the point where volume ceased to increase.	PS/PFM																				
11	Updated ComPAS Help	ComPAS Help has been updated to reflect new program features.	PFM																				
12	Calibration checking prior to testing	New calibration confidence checking has been added. If a lousy calibration has been accepted it will be prompted by a message prior to running any tests.	PS/MF																				
13	Mouth Pressure calibration correction for Morgan AUTO-LINK Plethysmographs	The calibration voltage for 10 cmH ₂ O is now checked so that an erroneous calibration cannot be accepted.	PS																				



#	Feature	Description	Engineer/Tester
14	Transflow Test confidence	Full confidence has been added to the Morgan Transflow Test instruments.	PS
15	Serial graph designer	Serial graph designing has been added to the 'hidden' graph tool.	PS
16	Addition of dual AtoD function for the SpiroAir	New device configuration for the SpiroAir to support additional USB AtoD capability ready for the addition of single breath nitrogen washout.	PS/MF
17	N2 Washout	Addition of database parameters for single breath nitrogen washout	MF
18	New Alert System	A new "Alert" function has been coupled with the "Confidence" system. The "Alert" provides ability to compare physiological data and then offer suggestions. For example: is the VA BTPS larger than TLC?	PS
19	Bronchial Challenge Graphic	For protocols not using a diluent level, the graphic has been changed to properly reflect the protocol levels.	PS
20	User-selection of IC	The ability for the technician to right-click and select an individual IC effort from the columns of SVC tests. The SVC and IC can be individually selected resulting in a computed ERV.	PS/RB
21	Dynamic (Auto-scaling)	During run-time tests of FVC, SVC, MVV and DLCO the graph scale can be set to either "Dynamic" or "Fixed". For dynamic scaling to work appropriately on FVC and SVC, at least 2 tidal breaths must be completed on the efforts. The scaling keeps the 2:1 ratio of flow to volume using whichever is the greater in scale: Actual PEFr or Predicted PEFr.	PS/RB
22	DLCO Expiratory Time-out	During the collection phase of the DLCO test, the automatic valve time-out has been increased from 3 to 6 seconds. This improves sample gas collection in cases of extreme low flow.	PS/PFM
23	Expanded Administrative Reports	New reports have been added to list physician/patient activity for purposes of billing records.	SRM/PFM
24	Super Predicted Calculator	A new utility allows for back-calculation of all stored tests using the current predicted equation set.	SRM/PFM
25	Connection Monitor	Improved network connectivity. Added ability to recover from minor connectivity issues.	MF/MF
26	Flow Volume Loop Resolution	Flow Volume loop resolution is now 10ml increments.	PS/RB
27	% Predicted Graphing	% Predicted has been added to the 'instant' serial data graph presented in Patient Biographical, Run-time Testing and Task Manager. An improved graphic design will be available in the next release.	SRM/PFM
28	Box Pressure Zero Offset	Changes in the Medisoft box electronics set-up require that we now read Box Pressure Zero with the door closed and Vent Open to achieve the auto-venting routine.	PS/PFM

ComPAS SQL Builds 1485-1490 Internal Development and Testing



ComPAS SQL Build 1491 Change List Issued - 12/01/2008

#	Feature	Description	Engineer/Tester
1	Revision of the "Build Flow Linearity Table" Menu	The screen layout for building flow tables has been simplified and an automatic removal of data outside of acceptable range function has been added.	PS
2	Body Box zero display during box pressure calibration	The calibration screen has been changed to reflect true box pressure zero during the first 10 seconds of calibration. After 10 seconds, the calibration pump is activated to show each 30ml stroke.	PS/RB
3	Patient "Search" default	The patient search will now default to the selected method last chosen. i.e. Search by: Name, Patient ID, Date of Birth etc.	MF
4	"Confidence" and "Alert" suppression	Ability has been added to suppress the "Confidence" or "Alert" messages from being displayed on subsequent test efforts on an individual test subject. The "3 Stars" still allow the technician to display either "Confidence" or "Alert" messages after they have been suppressed.	MF/PS
5	Addition of the Body Box Simulator QC Device	The Body Box Simulator can be operated either by a hand-held Palm device for individual VTG measurements or through a USB Bluetooth module for automated multi-efforts.	PS/RB
6	[Esc] function added to DLCO and VTG	The [Esc] key has been activated during both DLCO and VTG tests.	PS/RB

ComPAS SQL Builds 1492 Internal Development and Testing

ComPAS SQL Build 1493 Change List Issued - 01/22/2009

#	Feature	Description	Engineer/Tester
1	Expansion of the voltage range for Oxygen Sensors	The acceptable voltage range for oxygen cells has been expanded providing greater longevity and useful operational life for the cells.	PS
2	New valve control for Body Box units without DLCO	Changes were made for Body Box model 5500 (without DLCO) from sno.080916 onwards to ensure proper valve sequencing.	PS

ComPAS SQL Builds 1493 - 1533 Internal Development and Testing



ComPAS SQL Build 1534 Change List Issued - 08/03/2009

#	Feature	Description	Engineer/Tester
1	Updated SQL database to use SQL2008	This change was made to expand the allowable database size in MSDE for stand-alone users from 2GB to 4GB	MF
2	Revised Body Box Review and manual slope measure screens	The review screen for adjustment of FRC baseline, VTG Slope and SRaw slopes has been completely re-written for speed and additional capability.	PS
3	Addition of CPX	Full CPX testing has been added ready for a new Exercise Test System to be released later in 2009	SRM
4	Addition of SpiroAir-LT	The SpiroAir-LT USB 12L rolling seal spirometer was added as a new device	PS
5	Task Manager Search	A search routine has been added to allow for recall of any individual patient and test whether previously "Approved" or not.	MF
6	Task Manager Audit Column	An additional column capability has been added for those customers wishing to have an 'Audit' function.	MF
7	Task Manager Pulmonary Fellow Review Flag	Using the "Review Flag" allows a faculty member to "Approve" a test and at the same time return the file to the Pulmonary Fellow for later consultation.	MF
8	Scrolling Patient Entry Screen	The Patient Biographical Entry screen has been expanded with a scrolling feature to accommodate additional fields.	MF
9	New Input Variables on the patient entry screen	New fields for: latex allergy, pain, pain location and pain level also technician confirmation of two patient identifiers. Each of these new fields can be made mandatory.	MF
10	New tracking of patients with Kyphosis and Scoliosis	Patients indicated with kyphosis or scoliosis can be listed and in such cases technicians are prompted to measure height by arm span.	MF
11	Revised Patient Merge	The Patient Merge utility now returns you to the merge dialogue screen to make multiple merges easier.	MF
12	Corrected Bug in Dynamic Scaling for SpiroAir	Dynamic scaling of FV loops was corrected for SpiroAir and SpiroAir-LT	PS
13	New support for Hb correction of DLCO predicted	With changes in the ATS recommendations, we have added a configuration flag so that customers can select whether they want the Actual DLCO or the Predicted DLCO corrected for Hb and COHb. All standard predicted sets and the DLCO test script have been updated to read the new configuration flag.	MF/PFM
14	New background support for MBN2	New tabs and support have been added ready for new multiple breath N2 washout test coming soon.	MF
15	New background support for PFC	New tabs and support have been added ready for new peak flow cough test coming soon.	MF
16	Individual selection for FVC, FEV1, PEFr and FEF25-75	The right-click options for data selection have been expanded to include individual selection of FVC, FEV1, PEFr or FEF25-75 data. Any user selection of individual data is shown in red in both the report row/column and the test effort row/column.	MF
17	Automatic selection of AT in the CPX module.	Adoption of the Wasserman/Whipp criteria for automated selection of anaerobic threshold.	SRM



ComPAS SQL Builds 1535 - 1542 Internal Development and Testing

ComPAS SQL Build 1543 Change List Issued - 10/09/2009

#	Feature	Description	Engineer/Tester
1	Added Morgan _{FVL} Pneumotach	New hand-held USB pneumotach device added	MF
2	Modified temperature and pressure acquisition from Medisoft devices	Changes to Medisoft hardware required modification of the automated routine to acquire temperature and barometric pressure from the following devices: Body Plethysmograph, TransAir2 and SpiroAir. New routine accommodates all models and age of device.	PS
3	Research Query indexing by parameter name	Storage of research queries are now saved by database parameter name rather than database index number. This allows the research query capability to grow in future without breaking previously stored queries.	SRM
4	Modified Administrative Report for Physician Billing Activity	Physician billing activity now details the date of interpretation and the number of days since actual testing	SRM

ComPAS SQL Builds 1544 - 1579 Internal Development and Testing

ComPAS SQL Build 1580 Change List Issued – 05/15/2010

#	Feature	Description	Engineer/Tester
1	ComPAS Replication	A major new ComPAS advance which can provide immunity from network issues! When configured to use merge replication, a merge agent is constantly synchronizing data across the network. Reports stored on the network are available offline using the Windows offline files capability. The report files are automatically downloaded from shared folders on the network and stored on each computer. When disconnected from the network, the files are available to use. When reconnected to the network, any report changes are added to the master report files on the network in a process called synchronization.	MF
2	New Data Import/Export	Test data can now be exported from stand-alone devices and imported into the main ComPAS data base. The data transport uses external devices (thumb drives or CD's etc) for encrypted data transport.	SRM
3	New testing for Cough Peak Flow	The Cough Peak Flow (CPF) is the velocity of air being expelled from the lungs after a cough maneuver usually from maximum inspiration. This measurement can be expressed in L/min or L/sec (L/min divided by 60). Testing capability for CPF has been added to all Medisoft pneumotach devices (Body Box, SpiroAir, TransAir2 and MorganFVL)	PS



#	Feature	Description	Engineer/Tester
4	New testing for Single Breath Nitrogen Washout (SBN2)	<p>With the addition of N2 analyzer on the SpiroAir, single breath nitrogen washout tests are now available. A single breath nitrogen test (SBN2) is given to assess (1) the behavior of the dependent airways and (2) the uniformity of gas distribution in the lungs. Distribution is analyzed by measuring the change in N2 concentration during expiration of the vital capacity following a single breath of 100% O2. Measurements made from SBN2 include:</p> <p>Slope of Phase III</p> <p>Closing Volume (CV) is the volume from the onset of Phase IV to RV. It is expressed as % of the expired VC.</p> <p>Closing Capacity (CC) is defined as closing volume plus RV and is expressed as a % of TLC.</p> <p>Residual Volume (RV) is calculated from the alveolar dilution equation using the expired volume of N2 determined by integration of the area under the single breath curve.</p>	PS/AM
5	VOCO Metabolic Monitor	A collaborative development project between Morgan Scientific, Inc. and Qubit Systems, Inc. of Kingston, Ontario, Canada has produced the VOCO device designed to provide highly accurate measures of Ventilation, Oxygen Consumption, Carbon Dioxide Production and Respiratory Quotient for use in indirect calorimetry.	SRM

ComPAS SQL Builds 1581 – 1587 Internal Development and Testing

[ComPAS SQL Build 1589 Change List Issued – 09/15/2010](#)


#	Feature	Description	Engineer/Tester
1	Addition of “Lung Transplant Date” and “Best FEV1” since transplant	Serial data trend reports can now make use of serial FEV1 data for evaluation of performance post lung transplant. Reports can also present the lung function section (FEV1) of the bronchiolitis obliterans syndrome (BOS) scale. Physicians can identify the “Best FEV1” since lung transplant and the evaluation of the BOS scale used in specialized serial reports will begin from that date.	SRM/PFM
2	Expanded Past Test Check Box	The list of test types for past tests has been expanded to include the type of lung volume measured (plethysmography, helium dilution or nitrogen).	MF
3	New Serial Graphing Tool Capability	The “Test History” serial graph can now overlay BMI or weight on the Y2 axis. This is particularly helpful in CF clinics where test history can be viewed alongside that of BMI or weight.	MF
4	Improved oxygen compensation during helium dilution FRC testing	We have developed a better control algorithm for oxygen compensation during a closed-circuit helium FRC test. The improved routine estimates O2 demand from the slope of an averaged end-tidal position. For technician supplemental control: an “Up” and a “Down” arrow is available to increase or decrease O2 feed.	PS/PFM



#	Feature	Description	Engineer/Tester
5	Improved USB interface protocol for the Morgan _{FVL} Pneumotach	Changes in the Morgan _{FVL} EPROM allow ComPAS to ignore the auto-zero function previously set in the FVL device. Since this change, the zero behaves in exactly the same manner as other flow devices and the USB communication has improved.	PS
6	New testing for Multiple Breath Nitrogen Washout (MBN2)	<p>A multiple breath nitrogen test (MBN2) can be used in a further test of nonuniform ventilation of the lungs and also to obtain measurements of lung volumes. In early stages of peripheral airway disease, measurements of dynamic spirometry can often appear normal because the contribution to impairment by the small airways is insignificant until further progression has occurred. Peripheral airway diseases can be identified by studying the gas mixing characteristics of the lungs. A MBN2 test is similar to the SBN2 technique; the subject breathes 100% O₂ from a bag at atmospheric pressure, however instead of one single breath-in, this test requires normal tidal breathing over 7 minutes. As the subject quietly breathes, the expired nitrogen concentration is monitored. With each successive inspiration of 100% oxygen and subsequent expiration, the expired end-tidal nitrogen concentration falls as nitrogen is washed out of the lung.</p> <p>Measurements made from MBN2 include: FRC, Lung Clearance Index (LCI) and Moment Analysis</p>	PS/PFM/AM

ComPAS SQL Builds 1589 – 1594 Internal Development and Testing

[ComPAS SQL Build 1595 Change List Issued – 01/12/2011](#)

#	Feature	Description	Engineer/Tester
1	Windows 7 Support	Full Windows 7 capability for ComPAS.	
2	Addition of a new utility for remote support called “ComPAS Quick Support”.	<p>Under the “Help” section from the main menu is a new utility that uses a third-party web application from “Team Viewer”. This utility allows Morgan product specialists to provide on-line help, complete remote upgrades and edit reports etc. from a remote location.</p> 	MF
3	Expanded Task Manager Role for a second Pulmonary Fellow	The Task Manager now allows for a Pulmonary Fellow 1 and a Pulmonary Fellow 2. The main purpose of this is to accommodate situations where exercise and PFT interpretations might be completed by two different pulmonary fellows.	MF



#	Feature	Description	Engineer/Tester
4	Task Manager Interpretation History	A historical view now allows review of the interpretation process and thought. Faculty members can review the first pass at interpretations completed by pulmonary fellows to assist in teaching.	MF
5	A revised Physician Notes Tool in the Task Manager	Physician Notes are now displayed using an entirely new format which keeps the choices of customized interpretation text on the screen so that a series of sentences can be selected in series without the choices disappearing.	MF
6	Deletion of Challenge Protocols	Unwanted challenge protocols can now be deleted from the configuration menu.	SRM
7	Improved SBG Spirometer communication	The SBG algorithm has been converted into C# to improve both the serial and USB communication with ComPAS.	SRM
8	Improved Inbound and Outbound Message Service		JC

ComPAS SQL Builds 1596 – 1597 Internal Development and Testing

[ComPAS SQL Build 1598 Change List Issued – 02/28/2011](#)

#	Feature	Description	Engineer/Tester
1	Facility or laboratory header and address options	In the “Clinic Information” section of the configuration, you can now add supplemental remote locations each with their own address and telephone number, logo etc.	MF
2	Reports added to the database	Reports will now be stored within the database. The Report Editor has been extensively overhauled to provide ability for “importing” and “exporting” reports and report modules from the database.	MF
3	DLCO expired only gas analysis	A specific change request for a customer not wanting to measure the inspiratory gas values following DLCO. If this option is selected, the inspired gas values are assumed to be those of the cylinder.	PS
4	Task Manager prompt on exit	If the user chooses to exit ComPAS and there are tests that have not yet been “Approved” a user prompt is displayed.	MF
5	Added “Quick Support” to the Task Manager	Quick Support option has been added for users on the Task Manager.	MF
6	Support for the Ergoline Ergometer	The CPX module now contains a protocol designer for automatic control of the Ergoline bicycle ergometer. Protocols can be set for ramp, step or manual control during exercise.	SRM
7	Improved support for SBG spirometers under Windows 7	Drivers of the SBG spirometer (both serial and usb editions) have been improved for use under Windows 7. The runtime option has also been updated for customers using the SBG spirometers for real-time data acquisition.	SRM



ComPAS SQL Builds 1598 – 1622 Internal Development and Testing

ComPAS SQL Build 1623 Change List Issued – 09/09/2011

#	Feature	Description	Engineer/Tester
1	New F/V parameter “Kmax” (or curvilinearity index) can now be calculated from any expiratory flow volume loop effort	Each flow volume loop performed is given a curvature assessment and a calculated parameter of Kmax based on the following paper: "A Proposed Curvilinearity Index for Quantifying Airflow Obstruction" Chang-Jiang Zheng MD PhD, Alexander B Adams MPH RRT FAARC, Michael P McGrail MD MPH, John J Marini MD and Ian Greaves MD	SRM
2	FRC BTPS Calculation based upon temperature inside the cabin	There is some disagreement among pulmonary function experts as to the measurement of FRC when done by plethysmography. There are published references that say the value should not be corrected for BTPS whereas others have determined that the FRC should indeed be corrected. We recommend that FRC should be corrected for BTPS when measured by plethysmography. However, the temperature we use within the BTPS equation is taken from inside the cabin at the time of measurement rather than that of room temperature To accommodate peers with a different opinion, we have provided an option in the Plethysmograph Device Configuration screen to either apply a correction to FRC or not.	MF & PS
3	New interpretation comments capability	A new feature for use in the Task Manager allows users to use logic behind their interpretation text. The button text as seen by the physician when interpreting patient tests can now automatically update based upon actual results.	MF
4	Improved usb driver for MorganFVL	A new usb driver to accommodate Windows 7 has been deployed for the MorganFVL spirometer	JC & PS
5	Task Manager test amendment capability	Tests that have previously been “Approved” can be retrieved and amended. The amended test results are then re-submitted with appropriate flag/status.	MF
6	Predicted Scripts Updated	All standard predicted scripts have been updated to include predicted values for Cough Peak Flow and Six Minute Walk	PFM & MF
7	Plethysmograph box pressure calibration averaging	To minimize the possible effect of erroneous box pressure calibrations on very windy days, the program now keeps a running average of the 30ml/pressure calibration relationship and uses the average for all calculations.	PS

#	Feature	Description	Engineer/Tester
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8	New History Graphing Tools	<p>The new history graphing design provides significant enhancements including:</p> <ul style="list-style-type: none"> • Instant plots of actual data with options for predicted information (Mean, Lower & Upper) • Instant plots of percent predicted data • Ability to present a Y2 axis showing height, weight or BMI • Ability to zoom-in on any time period • Ability to view the CDC growth charts for children (height, weight and BMI) • Ability to add and edit text on the graph • Ability to plot trends between any two points and display and save trend data • Ability to have trending automatically calculated based on options of: <ul style="list-style-type: none"> ▪ plotting between two user-defined dates ▪ plotting from the most recent test back to a user-defined 'anchor' date ▪ plotting from the most recent test back a set number of days (user selectable) • Ability to directly print what is shown on the screen • Ability to "Save As" for exchange with Adobe or Excel and other programs 	JC & PFM
9	Helium analyzer response check	For all models of Medisoft instruments (Body Box, SpiroAir, TransAir and TransAir2) the helium analyzer response check has been removed. The original intent of the response check was to try and identify leaks in the absorber, but it proved unreliable and caused unnecessary user prompts.	PS
10	ComPAS Task Manager interpretation view	A new configuration allows users to "turn-off" the computer interpretation when tests are being viewed by pulmonary Fellows.	MF

ComPAS SQL Build 1624 Internal Development and Testing

ComPAS SQL Build 1625 Change List Issued – 10/02/2011

#	Feature	Description	Engineer/Tester
1	Task Manager mouse-over text display	For physicians with long sentences of pre-defined text, a mouse-over function has been added to view the entire text string.	MF
2	Task Manager shorthand display	The shorthand display text has been added to the front of each pre-defined text string.	MF

ComPAS SQL Build 1626 -1627 Internal Development and Testing



ComPAS SQL Build 1628 Change List Issued – 11/23/2011

#	Feature	Description	Engineer/Tester
1	Addition of Allen Test results in ABG	The ability to add Allen Test results has been added as a pull-down option in the ABG entry screen.	MF
2	CPX Graph Builder	The graph designer for CPX runtime options has been revised to allow for multiple Y and Y2 parameters with new drag and drop capability	JC
3	CPX Diagnostics	The CPX diagnostics screen has been revised to show firmware revision and firmware communication.	SRM
4	CPX Flow Volume	Filtering has been added to improve the quality of F/V loops when using the disposable pneumotach	SRM
5	CPX Graphing of Recovery	Graphs with both time axis and any parameter can now show "recovery" as a 'mirror' to the rest and exercise sections.	JC
6	Windows7 camera	New camera section has been added suitable for Windows7	SRM

ComPAS SQL Build 1628 -1656 Internal Development and Testing

ComPAS SQL Build 1657 Change List Issued – 09/10/2012

#	Feature	Description	Engineer/Tester
1	Revision of the SVC post test processing	At the request of customers, post processing will now consider test efforts hitherto rejected by the ComPAS confidence review. SVC, IC and ERV values will be displayed, but the confidence on poor efforts will remain as 3 blank stars	PS
2	Revision of the FVC post processing	Flow Volume efforts with a single expiratory effort can now be completed	PS
3	Task Manager multi-approve	A bug in the multi-approval of tests from the Task Manager has been corrected	MF
4	Test recalculation performance	The order of test recalculation has been amended to improve speed of performance	PS
5	Test Confidence performance	Test Confidence consideration of past test results has been optimized to improve speed of performance	PS
6	Patient Biographical performance	Patient biographical functions and test loading have been optimized to improve speed of performance	MF
7	SBG Spirometer	The SBG spirometry routines have been updated to allow for operation on Windows 7	SRM
8	MorganFVL pneumotachs	The FVL driver has been updated to improve operation on Windows 7 64 bit systems	JC
9	Expanded CPX Reports	Expanded functions for CPX reporting have been added including: data averaging and past serial trending	JC
10	Stanojevic Predicted Equations	Ability to process and use the Global Lung Initiative (GLI) Stanojevic Predicted Equations	SRM



#	Feature	Description	Engineer/Tester
11	Enhanced Test History Graph Functions	<p>Test History graph now has additional tabs:</p> <p>1) For viewing and overlaying current and past flow volume loops. New functions allow for instant viewing of Pre and Post loops plus a new table that shows columns for Pre, Percent Predicted, Post and Percent Change. Graphs auto-scale and can be single or multi-selected for overlays.</p> <p>2) A tool has been provided on the F/V screen to draw a straight line across any two points which is helpful when considering concavity of the loop.</p> <p>3) For access to both a personal "Library" where individual physicians can store and review useful documents and a general area for departmental documents viewable by all users. For example, a PDF of a paper used when interpreting tests.</p> <p>4) A right-click "copy to clipboard" function has been added so that history graphs can be pasted into third-party applications.</p>	JC
12	Automatic blood pressure triggers added to ergometer protocols in CPX	When automated blood pressure is added to an ergometer protocol, the BP is triggered during runtime, measured and stored depending upon the frequency desired and set.	JC
13	Correction of the left-hand [Run Test] button	If users clicked the left-hand [Run Test] button from patient entry, sometimes the height and weight would be blank. This has been corrected.	MF
14	Administrator Password Reset	Ability to use the "start" dialogue to reset an administration password in the event that users have forgotten passwords and removed the administration role. From "Start" type: ComPAS /adminreset	MF
15	Import of Medical Graphics CPX data	Ability to import cardiopulmonary data directly from the Medical Graphics Excel export file.	SRM
16	Ability to ignore spurious CPX data	User can graphically remove spurious data (for example HR data where an electrode has fallen off) so that those data are removed from graphical and numerical representation in reports.	SRM
17	New SQL Deploy installer	New SQL Deploy installer has been improved to allow operation on Windows 7 64 bit systems.	MF
	Pressure release button on CPX	A pressure release button has been added in the diagnostics for CPX. This will release the gas cylinder pressure to allow for easy disconnection of the gas hose.	SRM

ComPAS SQL Build 1657 -1731 Internal Development and Testing



ComPAS SQL Build 1732 Change List Issued – 02/03/2013

#	Feature	Description	Engineer/Tester
1	Ability to use different measures for entering or estimating standing height	Standing height can now be entered or estimated using the following options of source measurement: Standing Height, Full Arm Span, Demi-Arm Span, Knee Height, Forearm (ulna) Length.	MF
2	Modification of the challenge protocol editor to allow for use of Mannitol inhalation powder kits	Using Mannitol there are now 2 instances that trigger a positive response: <ul style="list-style-type: none"> • A 15% fall in FEV1 from baseline • A 10% incremental fall in FEV1 between doses 	MF
3	Interface to the Nonin WristOx	Automatic importing of data stored on the WristOx for six-minute walk studies. A new button on the Manual Entry screen provides the utility.	JC
4	Improved FVL USB driver	Improved error handling in the FVL USB driver	JC
5	Excel exporter for the CPX	Ability to create export worksheets and workbooks for CPX data sent to Excel	SRM
6	Addition of FEV0.75 and FEV0.75/FVC	New parameters added for the GLI predicted set	SRM
7	Improvement of ATS check	The “Satisfactory Exhalation” and “Early Termination” effort assessments have been improved to cover cases where an immediate drop in flow is followed by continued FET.	PS
8	New Mannitol report tables	New tables that show highlights where conditions were met for either Pc15 or Pc10 are available.	PFM & RB
9	New GLI report format	New graphic plotting variables on a standard deviation scale	PFM & JC
10	New CF Administrative Report	New administrative report that shows a summary of CF patient activity. Data include patient name, last test date, last BMI, Last FEV1% predicted, FEV1 change%/year, # of tests and r^2.	SRM

ComPAS SQL Build 1733 - Internal Development and Testing

ComPAS SQL Build 1734 Change List Issued – 02/28/2013

#	Feature	Description	Engineer/Tester
1	HL7 Billing changes for CHP	Custom billing changes for CHP	SRM

ComPAS SQL Build 1733 -2168 Internal Development and Testing



ComPAS SQL Build 2169 Change List Issued – 07/09/2014

#	Feature	Description	Engineer/Tester
1	Addition of the Pneumotrac Spirometer	The Vitalograph Pneumotrac pneumotachograph allows test capability of Flow Volume Loops, Slow Vital Capacity, MVV, Cough Peak Flow and Bronchial Challenge 1) New Diagnostics screen 2) Addition of an "end of test" indicator in FVC and SVC 3) Ability to plot a 'ghost' of the best FVC expiratory loop during F/V	SRM & JC
2	New History Tool function for past interpretation viewing	New ability in the history graph and Task Manager view to allow physicians to view previous interpretations. Past interpretations can be "copied" and "pasted" into the current record where modifications can be applied.	MF & JC
3	Addition of ICD-10	Full implementation of ICD-10 throughout ComPAS with ability to use General Equivalency Mapping (GEM) for transitioning from ICD-9 to ICD-10. Configuration allows display of ICD-9 and ICD-10 or just one or the other.	MF
4	New Patient Entry GUI	Patient entry has been converted into .Net and C# with a new "look and feel". On the table of past patient visits and tests completed, both "Pre" and "Post" checks have been added	MF
5	Ability to plot FeNO on the History Graph	The optional Y2 axis can now toggle between Height, Weight, BMI and FeNO	JC
6	Ability to 'Flag' BMI in report headers	New capability to calculate how much weight gain a CF patient would require to get from nutritional failure to "at risk" category (or from "at risk" to "healthy weight") based on their BM. The result can be displayed on the PFT report header together with a colored flag (red, yellow, green) indicating what BMI category the subject is in	MF
7	Ability to select grid color on any graph	Where grids are being displayed for report graphics, the color can now be change	PS
8	Ability to show the predicted set being used on reports	The predicted set being used can now be presented in reports.	MF



ComPAS SQL Build 2169 Change List Issued – 07/09/2014 Continued

#	Feature	Description	Engineer/Tester
9	Addition of new incentive graphic engine	New incentive screens and configurations for children have been added. The current build has only a birthday cake as an option. Future editions will include a dragon, rocket ship and unicorn.	FB
10	KoKo Converter	Customers updating from the KoKo spirometer can save their legacy data using a converter option in ComPAS.	SRM
11	Cough and glottis closure detection	An improved method for detecting glottis closure or cough in the first second has been employed	SRM
12	Ability to 'stagger' overlays of MVV graphics	Recent drug trial work demanded the unusual ability to overlay the graphics of MVV efforts. Each effort is 'staggered' vertically to provide a clear display.	PS
13	Ability to identify the 3L calibration syringe used in calibration	A new configuration section allows for entry of 3L calibration syringes. The database fields include Syringe Serial Number, Syringe Description and Date of Last Independent Syringe Verification/QA	SRM

ComPAS SQL Build 2170 -2405 Internal Development and Testing

ComPAS SQL Build 2406 Change List Issued – 02/28/2015

#	Feature	Description	Engineer/Tester
1	XML via MSMQ Interface with Spirotrac	Specifically, for clinical trial work in association with Vitalograph, this is an interface between ComPAS and the Spirotrac software to allow exchange of data and later interface with Vitalograph' s remote platform	JC
2	HL 7 Inbound Message Display	New feature: when a user queries for order information from the inbound HL 7 interface, it displays a screen with a list of all of the orders within the past X days (configurable time range) and allows them to select the correct order to associate with the visit	SRM
3	Addition of the In2itive Spirometer manufactured by Vitalograph	In2itive spirometer allows users to store patient information or enter patient information on the portable device, test subjects and then import those data into ComPAS. Unit is fully compatible with all ComPAS Task Manager features	JC



#	Feature	Description	Engineer/Tester
4	Improved Metronome for Plethysmographic Tests	The metronome feature has been enhanced with a new "tick tock" wave and animation to better illustrate breathing rates to test subjects. The frequency can be set in the VTG and Raw configurations. To use this feature requires a USB sound stick and microphone available from Morgan Scientific (less than \$70)	EB
5	Expanded Report Options	Further report styles have been added to suit asthma and allergy customer requests	PFM
6	SpiroAir New Patient Valve	Changes to support the new patient valve now being supplied with SpiroAir instruments	PFM

ComPAS SQL Build 2406 - 2426 Internal Development and Testing

[ComPAS SQL Build 2427 Change List Issued – 04/15/2015](#)

#	Feature/Bug Fix	Description	Engineer/Tester
1	DLCO results not showing up in report row	Sometimes the DLCO result following a test would not populate the results row in the mini results screen without the technician initiating a re-calculate	JC
2	Trend lines not showing up in Test History Screen	The default colors for trend lines were not being set on installation.	JC

ComPAS SQL Build 2427 - 2457 Internal Development and Testing

[ComPAS SQL Build 2458 Change List Issued – 06/30/2015](#)

#	Feature/Bug Fix	Description	Engineer/Tester
1	Ability for physicians to confirm or reselect the diagnosis code from Task Manager	To comply with requests by Epic, the physician can now confirm or select a new diagnosis code when "Approving" an interpretation in Task Manager. The same facility of diagnosis choices or searching is provided as used in the patient entry screen. The option is configurable in Configuration.	MF
2	Expanded report viewing in Task Manager	Previously, only 5 report styles could be directly called from Task Manager; this has been expanded to 10.	MF
3	Flat-line SVC efforts are now ignored	If a Slow Vital Capacity test is started and ended without any volume change (i.e. the test subject did not breathe on the device) the test is ignored	SRM
4	Right-click on "Export" individual test date	Right clicking on "Export" from the patient test history table was not allowing the user to select a destination; this has been corrected.	JC



#	Feature/Bug Fix	Description	Engineer/Tester
5	Adjusting the FRC baseline on the first VTG effort error	The FRC Baseline adjustment has been corrected for the first effort of VTG tests.	PS
6	Lung Transplant reporting using the new FEV1 guideline	Lung Transplant reports can now use the modified definition of FEV1 baseline: <i>Definition of baseline: The baseline value, to which subsequent measures are referred, is defined as the average of the 2 highest (not necessarily consecutive) measurements obtained at least 3 weeks apart, such measurements being made without the use of an inhaled bronchodilator preceding the study.</i>	MF
7	Preventing disabled diagnoses from being selected	Disabled Diagnoses were still selectable in the patient entry screen despite them showing as disabled in the configuration screen	SRM
8	The new Predicted Calculator Tool was not recalculating Z-Scores	The batch re-calculation of predicted values based on any set selected was not re-calculating Z-Scores; this has been corrected.	JC
9	Improvement to In2itive communication	Communication protocol updated	JC

ComPAS SQL Build 2458 - 2518 Internal Development and Testing

ComPAS SQL Build 2519 Change List Issued – 02/11/2016

#	Feature/Bug Fix	Description	Engineer/Tester
1	Editing of physician notes when in the testing screen.	Physician's when logged into ComPAS could not edit their pre-configured notes from the test screen; this has been corrected.	SRM
2	Integration of ComPAS with IMS	Full seamless integration of ComPAS with IMS software. From the orders screen in the IMS EHR, a single key-stroke takes users to spirometry testing in ComPAS. At completion of tests a single stroke returns to IMS with discrete data and a PDF	JC
3	Task Manager – Technician re-assignment	A bug was corrected to prevent the re-assigning of technician name when going from Task manager into the actual testing screens.	SRM
4	Reports	Numerous new report formats have been added primarily at the request of asthma and allergy centers	PFM
5	Adding ICD-10 diagnosis when exiting Task Manager	Further changes to comply with requests by Epic, the physician can now confirm or select a new diagnosis code when "Approving" an interpretation in Task Manager. The same facility of diagnosis choices or searching is provided as used in the patient entry screen. The option is configurable in Configuration.	SRM



#	Feature/Bug Fix	Description	Engineer/Tester
6	Calculation of Z-score	The Z-score calculation was changed to match the exact formula used in the GLI predicted recommendations	SRM
7	SpiroAir flow zero	Changes in the F/V data processing were made to avoid incorrect measurement of FET and FVC in the rare case of a false flow-zero being accepted prior to testing	SRM/PS
8	Dynamic Scaling	Correction made to the dynamic scaling algorithm for FVC and SVC so that the first effort is based on Predicted value and subsequent efforts based on actual best. For volume spirometers, the routine was also corrected for “expiratory only” effort types.	SRM/PS
9	Spirotrac/ComPAS	Changes in the interface to send individual SVC efforts from FRC rather than the best VC	JC
10	Closing on Post FVC after Raw	Correction made for the rare cases of ComPAS closing when trying to do post FVC studies after a series of RAW efforts.	JC
11	FVL conversion to .Net	The FVL spirometer is now in .Net matching all the capability of Pneumotrac	SRM
12	Barometric Pressure on the Body Box	A bug was corrected where the BP could be lost in the unlikely event of abandoning a gas calibration.	SRM/PS
13	Adjustments of zero setting for the new CO sensors	The new CO sensors take marginally longer to clear to zero so we have adjusted the “Clearing Gas Form” prior to calibration as required for SpiroAir, Body Box and TransAir2&3 instruments	PS

ComPAS SQL Build 2516 - 2527 Internal Development and Testing

ComPAS SQL Build 2528 Change List Issued – 03/10/2016

#	Feature/Bug Fix	Description	Engineer/Tester
1	Test Track updated to version 11.0	Test Track and the unique ComPAS remote login (ComPAS Quick Support) brought up to the 11.0 version.	MF
2	Custom importer for Riley CPX data	Importer to work with combined file of data export from the Riley Care Fusion CPET system	SRM
3	Ability to change loop colors on test levels	For report purposes, the loop colors can be selected in reports for data coming from Pre, Post, Diluent, Level 1, Level 2 and Level 3 etc.	PS
4	Bug fix for display of report default	Report default settings were working in ComPAS, but the flag indicating the default would always point to a Device Setup Report.	MF



ComPAS SQL Build 2529 - 2588 Internal Development and Testing

ComPAS SQL Build 2588 Change List Issued – 11/04/2016

#	Feature/Bug Fix	Description	Engineer/Tester
1	Changing date of test	Previous versions limited the changing for “date of test” within one calendar year. This has been changed to allow a date change within the range of the subject’s age.	MF
2	IMS Interface	The IMS interface can now be customized to send discrete spirometry data in the order required	JC
3	Incentive Graph Start	A new configuration setting allows users to prevent any incentive graph from triggering the expirate display. It is based on percent of VC; a default setting of 30% is recommended.	EB
4	TransAir3 and SpiroAir fill and empty routines	Changes to support new hardware configurations of the TransAir3 and SpiroAir that affected inspirate bag emptying and filling. Changes work with all generations of hardware.	PS
5	Addition of SNIP	Addition of Sniff Nasal Inspiratory Pressure (SNIP) measurement for TransAir3, SpiroAir and Body Plethysmograph	AM & PS

ComPAS SQL Build 2589 - 2635 Internal Development and Testing

ComPAS SQL Build 2643 Change List Issued – 03/01/2017

#	Feature/Bug Fix	Description	Engineer/Tester
1	2017 DLCO Effort and Reproducibility recommendations	The newly published ATS/ERS 2017 DLCO Effort and Reproducibility recommendations have been added into all DLCO device ATS forms.	PS SRM
2	DLCO Error check on inspirate bag	The system now measures and warns users if the test subject has breathed into the inspirate bag following the valve change to breathe-in.	PS



ComPAS SQL Build 2636 - 2642 Internal Development and Testing

ComPAS SQL Build 2643 Change List Issued – 06/09/2017

#	Feature/Bug Fix	Description	Engineer/Tester
1	Editing of Race	Ability to hide un-used Race designations from within Configuration	MF
2	Display of CPX impression for Attending2	CPX impressions will be displayed for use or editing when the Attending2 physician logs into ComPAS	MF
2	Improvement for Dynamic scaling in FVC	When dynamic scaling is selected, the first test effort will now use the default scale for Flow and Volume. Subsequent efforts will display appropriate to the patient results.	SRM
3	Import of MGCD CPET Blood Pressure Data	The importer for the MGCD CPET data will now recognize and include systolic and diastolic blood pressures	SRM
4	Correction of CPX tab	When CPX data are imported in the runtime screen, the [CPX] tab now appears without having to exit testing and return for display and possible editing.	SRM
7	Body plethysmography processing of VTG and Raw runtime	The need for temperature equilibration in the cabin prior to Raw or VTG tests has been eliminated. Innovative work to auto-compensate for temperature shifts allows immediate testing as soon as the cabin door is closed.	PS/AM
8	Parsing of F/V graphics, serial trend graphics and challenge from the ComPAS EMR API	The ComPAS EMR configuration allows parsing of discrete data, F/V graphics, serial trend graphics and bronchial challenge into third-party products like the Meditab	JC
9	Improved data collection from the In2itive spirometer	An improved communication routine with In2itive to cope with bad or spurious data that had been saved remotely on the device as a possible patient effort.	JC
10	Metronome rate display	The metronome rate display for plethysmography was corrected to use the value set in configuration for VTG and Raw	EB
11	Patient – Delete Test	Deleting a patient test now prompts twice before allowing the action.	JC
12	Patient – Delete Patient	Deleting a patient test now prompts twice before allowing the action.	MF
13	Flow -v- Time Graph	Replaced an older routine to plot the Flow -v- Time graph from any flow volume loop effort	PS



ComPAS SQL Build 2644 - 2645 Internal Development and Testing

ComPAS SQL Build 2646 Change List Issued – 09/09/2017

#	Feature/Bug Fix	Description	Engineer/Tester
1	Corrected a bug to allow deletion of the first DLCO effort	Deleting the first DLCO effort data could cause a ComPAS crash in certain circumstances. This has been corrected.	PS JC

ComPAS SQL Build 2647 - 2669 Internal Development and Testing

ComPAS SQL Build 2670 Change List Issued – 01/16/2018

#	Feature/Bug Fix	Description	Engineer/Tester
1	Corrected a bug on SpiroAir instruments on small F/V efforts	Very small flow volume loops could cause a crash of ComPAS when using the SpiroAir	SRM
2	Added GLI 2017 DLCO Predicteds	Capability to use the new 2017 GLI Predicted Equations was added	SRM
3	Corrected a bug on the Raw Loop adjust screen	Bug was not re-calculating SGaw after a manual adjustment of the Raw loop	PS
4	2017 DLCO Effort and Reproducibility recommendations were modified by the authors	The authors of ATS/ERS 2017 DLCO Effort and Reproducibility recommendations changed their assessment of a Grade F test. This change has been modified in ComPAS.	PS
5	Configuration for automatic reporting in Meditab	A configuration section has been added to set conditions for data and graphics being sent to the Meditab EMR	KL JC
6	Pneumotrac communication	Changed how a plugged-in Pneumotrac is detected. Now uses Windows Management Interface to query for the device. This was done to resolve an issue detecting the device when ComPAS is deployed in a RDS environment.	JC



ComPAS SQL Build 2671 - 2680 Internal Development and Testing

ComPAS SQL Build 2681 Change List Issued – 04/04/2018

#	Feature/Bug Fix	Description	Engineer/Tester
1	Corrected a bug on Pneumotrac not being recognized on different hot swappable workstation	Pneumotrac was not being recognized when reconnecting to a different hot swappable workstation	JC
2	Corrected a bug in the SVC test	Bug was crashing ComPAS while in SVC when processing a test with no data (spacebar hit twice quickly)	SM
3	Task Mana-ger	Runtime error was causing Task Manager to crash once the attending approved the test when it was set to auto-export the report file.	MF
4	All routine predicted sets were standardized for race correction	All routine predicted sets were standardized to have the matching race correction	SM



ComPAS SQL Build 2682 - 2709 Internal Development and Testing

ComPAS SQL Build 2710 Change List Issued – 11/05/2018

#	Feature/Bug Fix	Description	Engineer/Tester
1	Allow Test Approval from ComPAS Spreadsheet Screen	Bug Fix - Allow Test Approval from ComPAS Spreadsheet Screen while PDF export is enabled. In other words, do not force the user to approve from the Task Manager when a PDF export is enabled.	MF
2	Show pop-up 'Test was successfully approved'	Bug Fix - Show the user a pop-up stating 'Test was successfully approved' when a test is successfully approved from the ComPAS Spreadsheet screen	MF
3	Show pop-up for HL7 Script Errors	Bug Fix - Show pop-up to user and abort test approval if a HL7 script errors occurs during test approval	MF
4	Show pop-up for Report Errors	Bug Fix - Show pop-up to user and abort test approval if a Report errors occurs during test approval	MF
5	Updated Unity Code in RDS	Bug Fix - Updated Unity Code for incentive graphic errors in Remote Desktop Environments	LH
6	Disabled Race Correction	Bug Fix – Disable Race Correction Check Box in Configuration now works as expected (i.e., when checked in configuration, the race correction check box in patient entry is disabled and defaulted to unchecked).	SM
7	Removed BTPS Correction	Bug Fix - Removed BTPS correction from VTG calculation script	PS
8	CE Mark / Document added	CE Mark / Document added to Help->About	MF
10	Challenge test	Bug Fix - Challenge test returning the correct cumulative dose	SM