PHILIPS

IntelliSpace Corsium

Real-time makes a real difference

Web-based software platform for real-time patient data transfer and two-way communication

Introduction

Philips IntelliSpace Corsium[1] is a web-based software platform for real-time patient data transfer and two-way communication, designed for modern EMS.

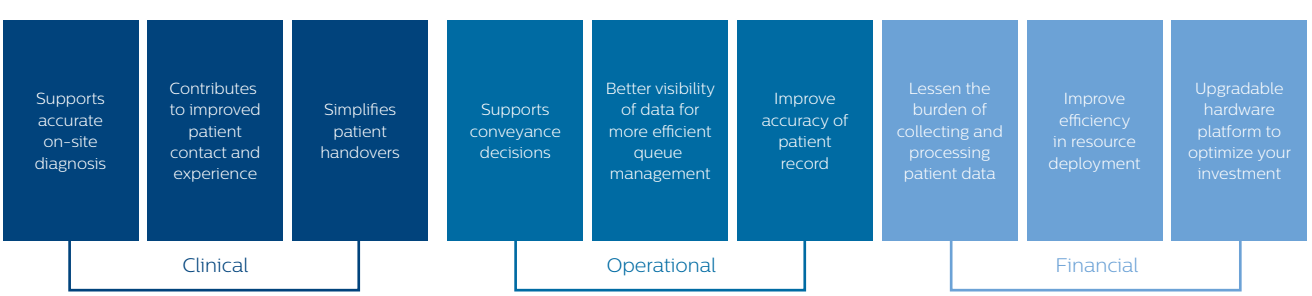
By supporting the rich data capture from the Tempus ALS system[1], it supports decision making by enabling unparalleled real-time data transmission and two-way communication between healthcare professionals.

The Tempus ALS captures clinical and on-scene data, such as vital signs and images. Using IntelliSpace Corsium with unrivaled encryption and transmission capabilities, data is securely shared and reviewed for true two-way consultation.

Key features

- Real-time transmission of rich patient and scene data, even under poor network conditions
- Two-way communication enables quick and efficient review of ECGs and patient vital signs. The next level of care can provide diagnosis, clinical decision support and transport instructions directly back to Tempus Pro
- A secure web browser allows medical personnel to view live patient data on a web-enabled device. This means that remote medical support can be provided when patients are being seen, treated and transported
- Centralized device and user management

Benefits



Overview

Automated shared data

The Summary Record of Care (SRoC) data collected by the Tempus ALS system, consisting of Tempus Pro and Tempus LS, is streamed to Corsium. The triggers for automatic streaming of SRoC[2] data to Corsium are configurable; the patient data shared includes the following:

- 12 Lead ECGs
- Tempus LS data such as CPR therapy, shocks/times/energies and waveform snapshots
- User entered assessments, events, drugs, therapies, fluids and interventions
- 20 second waveform snapshots; captured automatically during patient alarms, e.g. arrhythmia detected
- Trended history of vital signs
- Patient details and notes entered on Tempus Pro
- Injury records including body maps for injuries, burns, tourniquets, dressings and GCS scores
- Images from the Tempus Pro camera
- Intubation images

Reliable data transmission (EDS)

Data is streamed automatically during the initial assessment and transport of the patient using RDTs own patent pending Enhanced Data Service (EDS) protocol[3]. EDS is designed to ensure effective data transfer even when the underlying connectivity is poor or of low bandwidth. Using EDS Tempus Pro can transmit via Wi-Fi, Ethernet or 2G GPRS or 3G cellular GSM or 4G cellular (via a MiFi or similar tethered device).

Flexible data viewing

Data from multiple Tempus Pro systems can be viewed on Corsium by medical teams and personnel supporting the patient transport or preparing to receive the patient on handover. Patient data can be viewed via a standard web browser (Chrome, Safari) on a range of devices including PCs, tablets and smartphones.

Dashboards

Live Device Dashboard: displays a list of connected Tempus Pro systems. The list can be filtered to show devices from specific clinical teams.
ECG Dashboard: displays a list of ECGs that have been sent for expert ECG review. The ECG review details and ETA if known are also shown. The list can be filtered to show ECGs sent to specific support centers. Historic Dashboard: allows users to search and view historic incident data.

Live data view

Live patient data including vital signs and waveforms are displayed when a connected Tempus Pro system is selected from the Live Dashboard or an ECG is selected from the ECG Dashboard.

ECG review with feedback

Corsium enables quick and easy review of ECG with patient management instructions delivered to the care giver at scene:

- Whilst monitoring the patient with Tempus Pro the care giver records and sends an ECG to a selected support center or hospital
- The ECG expert, using Corsium in the selected support center, receives audio and visual notification that a review is required
- After reviewing the ECG in Corsium the reviewer sends diagnosis and transport instructions back to Tempus Pro
- Tempus Pro provides audio and visual notification of the incoming ECG review; the care giver at scene then reads and acknowledges the transport instructions

Centralized device management

Using Corsium, Technical Administrators or Bio-medical Engineers can configure the following:

- Triggers for sending data to Corsium, thereby ensuring that all the required clinical data is appropriately shared
- Support / ECG Review Centre List, used when sending ECGs for expert review
- Clinical Team List used to provision team-based filtering on the Live & ECG Dashboards

Going forward, Technical Administrators and Bio-medical Engineers will be able to update device settings, perform software updates and install new features.

User account security

Corsium has been designed to ensure that access to the recorded incident data is secure. Key measures include the following:

- New accounts can only be created by Technical Administrators
- Strong passwords are enforced on all user accounts. Technical Administrators must always use two-factor authentication
- Throttling policy to protect against brute force attacks
- Field-level validation is performed to ensure data integrity
- User sessions are automatically timed out after an inactivity period to prevent persistent authentication.
- Technical Administrators only have a limited visibility of patient data

Audit history

Corsium Suite provides an extensive audit of user activity including full details of any failed logon attempts, details of the viewed incident data and details of attempts to access unauthorized data.

Patient de-identification

Technical administrators will be able to configure patient de-identification automatically at a configured time interval. Additionally, in response to a request to delete data for a specific patient, Technical Administrators will be able to search and then de-identify the requested data set incidents.

Security and Compliance

Cloud infrastructure

The cloud-based infrastructure used to deploy Corsium utilizes:

- Hardened machine images
- Enterprise-grade Antivirus software
- Intrusion Detection Systems
- Automated Backups
- Event log management
- Scheduled application and OS-level patching
- Multi-zone hardware redundancy
- 24x7 System Health and Security monitoring

Data security

- Tempus Pro systems cannot communicate with Corsium until encrypted authentication settings in a bespoke RDT format have been imported onto Tempus Pro
- Patient data is not exchanged until Tempus Pro and Corsium have performed authentication. As part of authentication a dynamically generated secret is exchanged
- All data at rest exchanged between the Tempus Pro system and Corsium is AES-256 encrypted using FIPS compliant technology. To provide an additional layer of security the AES-256 encrypted data is then shared using secure (DTLS) sockets
- All data containing personal health information (PHI), is AES-256 bit encrypted using a security key that is unique for each customer. Note that the storage key is different to the transport key. The AES-256 encrypted data is then stored in an encrypted database
- Data exchanged between internal Corsium servers is encrypted
- Web browser access to Corsium is via Secure HTTP
- Data exchanged between internal servers is encrypted

Cyber security

The design of Corsium has been evaluated against the following cyber-security standards: ISO 80001-2-2:2012

Software Development

All elements of Corsium have been developed in compliance with IEC 62304:2006 AMD1:2015 as a part of RDT's quality system.

Supported Hardware

Monitor: Tempus Pro, Defibrillator: Tempus LS

[1] Corsium and Tempus LS-MANUAL are pending 510(K)clearance and are not available for sale in the US
[2] The SRoC data set is fully configurable by the user's organization
[3] UK patent application no. 1817817.8

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