Information Flow Explanation of Cliniconex Survey Service

General Information

Cliniconex is a Software as a Service (SaaS) product offering allowing healthcare providers the ability to communicate with patients. The survey service integrates directly with the clinic EMR to retrieve information to contact the patient.

At no time during the process is personal information stored to disk in the Cliniconex system. The information is assembled and passed through the application using well known secure web protocols such as SLL and TLS. Also a unique architecture described below ensures no one component of the Cliniconex system contains (even in memory) both personal information and survey results and/or appointment details.

Below is List all personal information (PI) and/or personal health information (PHI) that is collected to use in the survey service:

No.	Data Element	Details/Comments
1.	Appointment Date and Time	Used to understand who had specific appoints for what and when.
2.	Patient Name (optional)	At provider's option, reading the patient's name can be disabled.
3.	Patient Contact	Home, work or mobile telephone number or email address
4.	Appointment Type	Certain appointment types require surveys and others do not.
5.	Provider name (optional)	At provider's option, reading the provider's name can be disabled.
6.	Office Identifier	Office identifier is a code indicating in which office the appointment is scheduled (used in multi-site clinics). This is not the clinic address.
7.	Appointment Status	Typical appointment statuses: Reminder Sent, Confirmed, Cancelled, Left Message, No Answer, Picked-up No-answer, Please Call. This field is used to figure out who actually had specific apointments.

The Cliniconex Survey service safely and efficiently collects important data about your patient base in alignment with government regulations. Cliniconex email, voice or text surveys fully integrate with EHR/EMR's. The surveys are sent to a configurable

portion of attendees in a day. Cliniconex then sends back the report that can easily be stored for future reporting. This is a secure way to collect sensitive information, and requires less effort and time than paper surveys.

It is important to note that surveys are most often used after a set of patients have had appointments and therefore collecting appointment information is an important part of the process for the Cloud Controller can function. This is explained in the information flow section below.

Information Flows

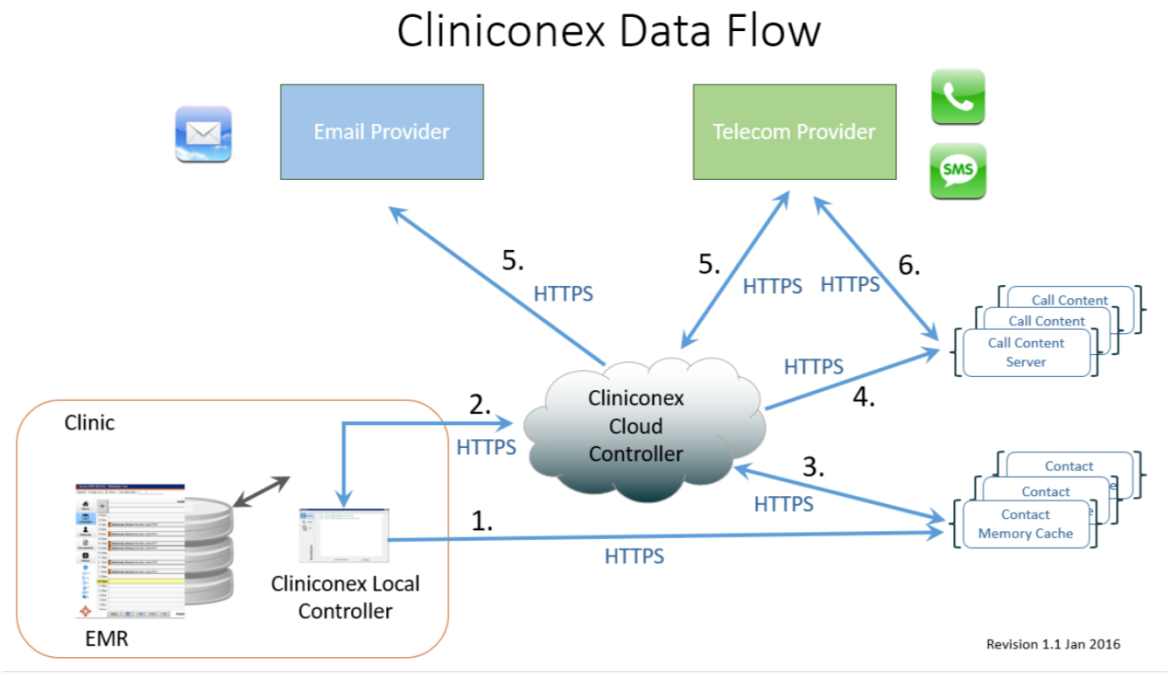

Figure 1: Cliniconex Data Flows

Overview of Data Flows

In Step 1, the patient information (eg. name, phone, email …) are sent to the content memory cache. These cache servers are located in a Toronto data center. The content memory cache servers in turn return to the local controller random numeric identifier. This random identifier serves as the reference index for retrieval of contact details in future steps. The connection between all components of the system use SSL.

Contact Memory Cache servers are specialized servers with no persistent storage (such as a disk drive), storing data solely in volatile memory. The contact memory caches delete data older than 30 days daily, by default. A configuration change can reduce this to a shorter interval.

In Step 2, the appointment details (eg. type, date, provider/clinic info…) and the random identifier (created in step 1) is sent to the Cliniconex Cloud Controller.

At this point the Content cache server (in Toronto) contains PI which is associated with a random identifier that only means something to the Cliniconex system. This data is not stored on disk. It only resides in the memory of the running process. The cloud controller (Google cloud in the USA) has reminder information associated with the random identifier. With the exception of the appointment data (which is obfuscated and the random identifier, the data in the cloud controller is also not 'stored' on disk, rather it resides temporarily in volatile memcache for the purpose of constructing the eventual reminder.

The random identifier effectively de-identifies appointment details stored in the Cliniconex Cloud Controller. The reference index is deleted from the reminder application after 30 days and the system can be configured to delete it from volatile memory right after the appointment reminder has been delivered to the patient.

<u>The survey message assembly:</u>

In Step 3, the Cliniconex Cloud Controller begins assembling the survey by asking the content memory cache for the PI (name, email, …). It does this by requesting the PI associated with the Cliniconex random identifier. The content memory cache sends to the cloud controller the PI for the appointment. As discussed earlier all of these requests use secure web protocols (SSL, TLS…). The PI sent back to the cloud controller is NOT stored on disk. It resides in memory in the process controller for the purposes of assembling the message and is deleted after the message is delivered successfully to the patient.

In the case of an email survey (Step 5), the template is assembled, including all template customizations, such as the patient first or last name, if used. In Step 5, an email survey is initiated via Amazon Web Services (AWS). The same process is true for text except the third party provider that the assembled message is sent to is Twillio's SMS service.

For Steps 4-6, Voice reminders follow a multi-step process.

In Step 4, the content of the survey in its entirety is sent from the cloud controller to the call content server (eg. Jane you recently had an appointment with dr xyz and we would like to ask your opinion on the following). The call content server returns back to the cloud controller a unique message URL. Again this information is never 'stored' on disk. Rather it is stored temporarily in memory for the purpose of assembling and delivering the reminder.

Finally in Step 5 (for voice only), the cloud controller sends a secure message to Twillio referencing the message URL and the telephone number to call. Twillio then retrieves the message URL (which contains the MP3 with voice instructions) and delivers the message to the patient.

Responses to the voice or SMS reminder are registered and stored for reporting purposes by the cloud controller.

The only details stored on disk when this process is over are de-identified appointment details, not attached in any way to personal information. This is retained for billing and tracking purposes only. The retention period of this data is configurable but by default it is removed after each 30-day billing period.

It is also worth noting that the local controller pushes data to other parts of the Cliniconex system. There is never a case where other parts of the system push data into the local controller. In addition it is worth noting that the local Cliniconex system pulls data from the EMR. It does not write back into the EMR.