

The Importance of Cold Chain in Healthcare

By Nitin Dahad of Cold Chain IQ

Mirroring industry trends, this year's [Cold Chain Global Forum](#) will feature more sessions on topics such as vaccines, blood & tissues, biobanks, hospitals and pharmacies. In anticipation of the event, we wanted to share some of the hottest trends in these areas which highlight the growing importance of cold chain in healthcare.

Vaccines

The recent investment of US\$1.4 million by the Bill & Melinda Gates Foundation in [innovative refrigeration technology](#) to bring a life-saving vaccine cooler to market is an important development. It is an indicator of the need to maintain vaccines at appropriate temperatures to ensure patient safety, and to help save lives.

Immunization helps protect individuals and communities from infectious disease. However, to remain effective, vaccines need to be stored within the temperature range recommended by manufacturers – usually in the range +2C to +8C. Incorrect storage of vaccines can be wasteful and costly, and can also reduce or nullify the potency of the vaccine.

Many healthcare delivery organizations that provide vaccinations have strict guidelines to ensure the effectiveness of the vaccines is maintained, and that all parts of the cold chain, including independent contractors:

- Ensure there is a relevant policy on safe storage of vaccines, including having a designated person responsible for receipt and storage of vaccines.
- Have procedures in place to assure themselves that that all relevant departments and providers adhere to the policy for vaccine cold chain storage

- Review storage temperature readings in a manner that will identify if vaccines have been stored correctly or encountered any temperature excursions outside manufacturers' recommended temperature ranges before they are administered to patients
- Have procedures in place for remedial action in case of temperature excursions

The need for vaccine storage at correct temperatures demonstrates the importance of the cold chain in healthcare. Whether they are using vaccines or expensive medication that can deteriorate outside a manufacturer's recommended temperature or humidity range, places like hospitals and healthcare service providers cannot do without refrigeration. From the point of view of ensuring patient safety, monitoring these facilities is extremely important, and being able to take remedial action in case of some failure is equally critical.

Real-Time Monitoring

Many hospitals are utilizing [technology platforms to provide actionable real-time monitoring and reporting](#). One example is a hospital in Nieuwegein/Utrecht, The Netherlands, which has more than forty cold stores and freezers distributed among its three campuses. The contents of these fridges and freezers are very expensive and if anything is lost, patient safety is put at risk. Quick action is therefore essential if temperature excursions occur.

The hospital equipped a total of 43 cold stores and freezers with a wireless monitoring solution (from Dyzle) for temperature and other parameters, and if anything goes wrong with a cold store, the personnel of the department in question are notified instantly with real-time email and text alerts. It provides operational staff 24-hours a day assurance, and instant indication of anything that goes wrong. If a door is ajar, for example, it can quickly be closed.

The hospital not only gets a real-time monitoring solution, but also reports of the vaccine's temperature history presented in an easy-to-read format. The data stored on the cloud-based server is shown at the hospital as a dashboard via the Internet. If a cold store exceeds its temperature limits this is visible on the dashboard, and the person responsible at the hospital is notified by means of a text message, via email or by telephone. It enables immediate action to be taken.

Immediate action is particularly important in the case of stored human-derived materials like tissue, blood or viruses, which shouldn't fluctuate too much. In another hospital wireless temperature sensors monitor the blood storage facilities, cold cases

and freezers. From a patient safety point of view, it is absolutely unacceptable if temperatures fluctuate beyond specified temperature ranges.

Real-time measurement enables instant feedback and this is the difference between this type of solution and data loggers. Prior to the wireless sensors, the hospital would put data loggers in their cold cases and freezers and read them once a week. This never allowed the performance to be viewed in in real-time.

The monitoring of key parameters in the cold chain is just one part of the story. The other elements of the system include relevant reporting and analytics, and automatic provision of records for regulatory reporting purposes.

We are hearing a lot about machine-to-machine communications (M2M), big data, and the cloud. The solutions described above bring together all of this emerging technology into real world relevance for the cold chain in healthcare: wireless monitoring (M2M), reporting with appropriate dashboards (big data), and temperature history through the entire cold chain for regulatory requirements (via the cloud).

Learn More at the Global Forum

To go into much greater depth on these topics in sessions such as **“Implementing Initiatives to Improve Last Mile Delivery and Vaccine Management**, attend the 12th [Cold Chain GDP & Temperature Management Global Forum](http://www.coldchainglobalforum.com).

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