National Collaboration to Help Develop Provincial Red Cell Redistribution Programs in Canada

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BACKGROUND:

- Canada now has 6 provincial blood coordinating offices to over see the funding provided to the blood suppliers and to encourage and support good blood utilization and management in hospitals.
- Stocking sufficient inventory to maintain patient safety can result in high expiration rates.
- Most provincial offices identified a redistribution process as a way to manage outdating and minimize wastage rates of red cells.
- To comply with accreditation requirements and to ensure patient safety, hospitals participating in a red cell redistribution program require a validated shipping container (SC).
- Validation plans were initially drafted independently by several of these blood offices, which resulted in duplicate work across the country.
- In May 2007; 7 out of 10 provinces were represented to form the National Redistribution Working Group (NRWG). Alberta participated although they do not have a provincial blood office.

PURPOSE:

The purpose of the NRWG was:

- To validate a shipping container that could be used for hospital redistribution of near outdating red blood cells.
- To reduce the time required to perform the validation process and implement a redistribution program by sharing responsibilities among members of a national working group.
- To standardize the redistribution program nationally.
- To reduce the cost of performing a validation process and implementing a redistribution program.
- To introduce a nationally accepted validated shipping container for the purpose of redistributing red blood cell units.

METHOD:

- Using set criteria the working group selected a shipping container based on innovation, ruggedness, durability, ease of use, and performance reviews.
- The working group also identified the validation protocol requirements to include both an in lab validation (IL) as well as an in field validation (IF).
- Data loggers were used to record temperatures at set intervals and plot a graph to interpret and assess the temperature fluctuations in the laboratory and out in the field.
- The IL validation was designed to be performed once for the entire country; the IF validation was written to be repeated for each geographic area for each season of use (Spring, Summer, Fall, Winter).
- A training program was created and used to maintain a standardized process.

RESULTS

Figure 1

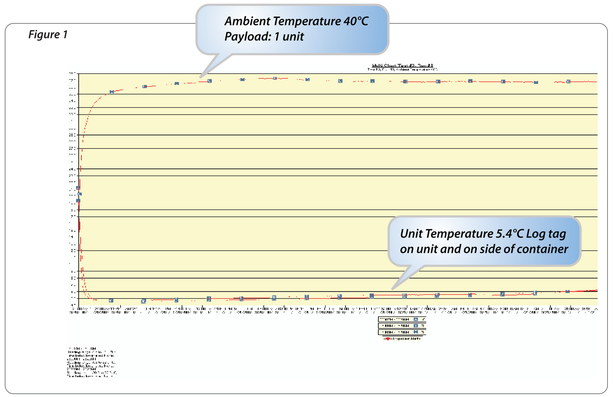
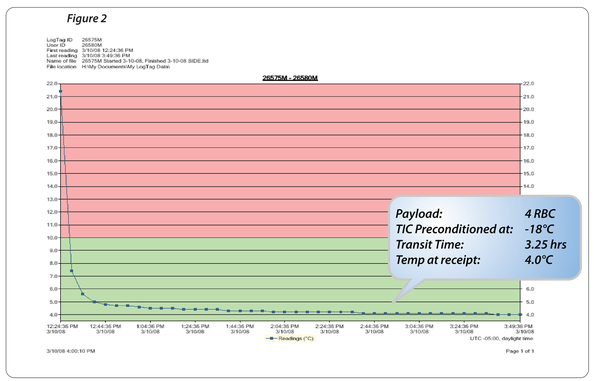


Figure 2



IN LAB VALIDATION RESULTS (Average Results)
Table 1

Ambient Temperature	Payload 1 RBC Unit	Payload 4 RBC units
-20 °C	5.5 °C	5.6 °C
4 °C	5.4 °C	6.5 °C
22 °C	5.0 °C	4.7 °C
40 °C	5.4 °C	5.1 °C

IN FIELD VALIDATION (Average Results)
Table 2

Ground 1 / Run # 1-6	TIC Preconditioned: -18 °C	Transit Time: 3.19hrs
	Ambient Temp: 16.0°C	Temp at receipt: 4.5°C
Ground 2 / Run # 7-12	TIC Preconditioned: -23.8°C	Transit Time:5.13 hrs
	Ambient Temp: 20.3°C	Temp at receipt: 6.4°C
Air 1Summer / Run #1-3	TIC Preconditioned: -24.0°C	Transit Time: 8.0 hrs
	Ambient Temp: 16.0°C	Temp at receipt:4.0°C
Air 2 Winter / Run #4-6	TIC Preconditioned:5.0 °C	Transit Time: 8.0 hrs
	Ambient Temp: 8.0°C	Temp at receipt: 7.0°C

Figure 1 is an example of the data logging chart of a in lab validation run. The chart can plot 3 sets of data points as demonstrated here.

Figure 2 is an example of a data logging chart from the in field validation showing just one data point being plotted on the graph.

Table 1 shows results of in lab validation using the 4 temperature points that represent approximate average outdoor temperatures the SC would encounter in Canada. Each payload was tested for 30 hours in these temperatures. Data loggers were used both inside and outside the SC to capture the temperature at set intervals. The result was that the SC maintained acceptable temperatures inside the chamber for the 30 hours tested.

Table 2 shows results of in field validation using existing courier system (car, truck, airplane) where payloads of 1 or 4 units were received at larger sites from smaller sending sites. There were 12 acceptable ground runs and 6 acceptable air runs. Validation revealed areas for improved process control (e.g., definition of ambient temperature as that of the interior of the transport vehicle rather than the outside temperature) that were incorporated into the final procedures. The result was that the SC maintained acceptable temperatures inside the chamber for the duration of each run.

CONCLUSION:

- Provinces represented on the NRWG agreed to review the data collected from the validation and endorse the shipping container as an alternative to the blood supplier boxes for their provincial redistribution programs.
- Collaboration between provinces reduced timeframe for implementation of multiple redistribution networks across the country and is now facilitating the use of a standardized approach to this process.
- Developing shared validation procedures can save time and expense and allow for more rapid roll-out of blood redistribution networks.

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