Focus Study: Specimen Integrity and Transport Times Using a TransLogic Pneumatic Tube System

MidMichigan Regional Medical Center - Midland

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MidMichigan Medical Center - Midland is a 324-bed hospital located on a 146-acre campus and is the flagship of the MidMichigan Health System. The Medical Center has established itself as a leader in providing state-of-the-art healthcare.

MidMichigan Medical Center - Midland installed a 6-inch 48-station TransLogic Xpress pneumatic tube system (PTS).

Purpose

This study was divided into two parts to determine the following:

- Potential of biochemical changes in specimens transported using the TransLogic PTS.
- Potential of hematological changes in specimens transported using the TransLogic PTS.

Prior to the implementation of the PTS, the Laboratory Pneumatic Tube Team performed a comparison study of biochemical and hematological test results to document studies performed at other institutions.[1,2]

Methodology and Results

Blood specimens were obtained by venipuncture from normal healthy volunteers. Each set consisted of vacutainer tubes drawn at one time into three corvac tubes, two EDTA and two citrate tubes. One of the corvac tubes was purposely only partially filled, (i.e. short sampled). The other two corvac tubes were completely filled. One set of specimens was handcarried to the laboratory and the other set was transported by the PTS. The short sampled corvac tubes were also transported in the PTS. The PTS carriers were lined with appropriate foam padding to immobilize the corvac tube samples.

SOURCE

01 Evaluation of the Use of the TransLogic 6-inch Pneumatic Tube System for Delivering Blood Specimens to the Laboratory and Blood Products to the Wards, Delanghe, et al, Victoria Hospital, 1986

02 Evaluation of a Soft-Handling Computerized Pneumatic Tube Specimen Delivery System, Albert Keshgegian, M.D., PhD, Glenn Bull, M.S., MT (ASCP), Bryn Mawr Hospital, Bryn Mawr, PA, October 1991

The duplicate specimens were then tested in parallel for LDH (lactate dehydrogenase), Potassium, RBC (red blood cell count), PLT (platelet count), HGB (hemoglobin), Protime (prothrombin time) and APTT (activated partial thromboplastin time). The short sample tubes were tested for LDH only. This test is the most sensitive to hemolysis and is the best indicator of possible increased agitation within the partially illed tubes (see Table).

Comparison of Mean Value for Laboratory Tests Transported by Hand and the TransLogic Pneumatic Tube System

Test	Units	Hand Carried	Pneumatic Tube Mean	Pneumatic Tube Short Sample
LDH	IU	489.00	480.00	510
Potassium	Mmol/1	4.30	4.20	n/a
RBC	$x10^{12}$	4.39	4.41	n/a
PLT	$x10^{3}$	279.00	286.00	n/a
HGB	g/dl	13.90	13.90	n/a
Protime	seconds	12.90	12.70	n/a
APTT	seconds	29.80	30.70	n/a

Conclusion

The change in biochemical and hematological test parameters for blood specimens were within the range of reproduce-ability for the instruments and methods used. The partially filled corvac tube results were essentially identical to the full tube results. This reduces the concern that there might be additional hemolysis preset in partially filled vacutainer tubes that have been sent through the PTS.

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