Drucker Diagnostics

Pre-Analytic Sample Processing
Stout C, et al., 2015

WHITE PAPER

DRUCKER MODEL 642E/M

With BD Vacutainer™ PST w/Gel for Transport

To validate that the Drucker 642E/M horizontal centrifuge with BD Vacutainer™ PST provides the required separation and stable gel barrier required for transport of collection tubes without significant risk of gel barrier leakage and contamination of the plasma sample during handling and transportation to the testing laboratory.

BACKGROUND

Handling of tubes during transportation to the testing laboratory can cause gel barrier breakage, leakage, and remixing when specimen tubes are not adequately centrifuged. If this occurs, among other things, Potassium (K) results will elevate over time cause falsely elevated potassium reporting in the following conditions:

- The specimen is chilled prior to or during centrifugation
- Cells remain in the plasma above the gel layer post centrifugation
- The gel layer fails, allowing remixing between the plasma and the cells
- The gel layer allows leakage between the plasma and the packed cells
- A specimen tube is centrifuged twice due to poor gel layer formation

METHODS

30 blood specimen were collected with BD Vacutainer™ PST Lithium Heparin tubes and centrifuged using the Drucker Model 642E/M horizontal centrifuge using the default factory settings. The factory settings provide an operating speed of 3450 RPM, 1,600 xg, and 10 minutes of centrifugation time.

The 30 blood specimen were analyzed for potassium (K) immediately after centrifugation and packaged in traditional zip lock style bags for overnight transportation. The tubes were shipped overnight by courier and then returned to the lab the next day for re-testing.

The 30 blood specimen were received from the courier the following day and re-analyzed for potassium. Approximately 18 hours had passed from pre-transport analysis to post-transport analysis.

druckerdiagnostics.com
sales@druckerdiagnostics.com
+1-877-231-3115 (U.S. only)
+1-814-692-7661

WHITE PAPER

RESULTS

After collecting and centrifuging thirty (30) Vacutainer™ 7 mL PST tubes, each tube was inspected for gel formation and separation. In all cases, the gel had formed a complete and uniform barrier between the packed red blood cells and the plasma. No hemolysis or other specimen issues were noted. No specimen tubes were centrifuged more than once.

All tubes were tested for Potassium using an IL flame photometer pre and post transport.

- The Average pre-transport Potassium was 3.97 mmol/L
- The Average post-transport Potassium was 4.05 mmol/L
- The Average difference between the two 0.08 mmol/L
- The Average percent difference was 2.12%
- The Correlation between pre-transport Potassium and post-transport Potassium was 96.82%
- The Average time between pre-transport and post-transport testing was 18.3 hrs

CONCLUSIONS

It is the professional opinion of the laboratory manager that the Drucker 642E/M centrifuge with horizontal rotor and factory settings is well suited for BD Vacutainer gel tube preparations that require transportation to a testing laboratory such as reference laboratories or hospital outreach locations.
The test data can be found in Addendum A. The test protocol was executed under the supervision of Beth Bubb, (MT) ASCP

The test data can be found in Addendum A. The test protocol was executed under the supervision of Beth Bubb, (MT) ASCP

TEST LOCATION

Drucker Diagnostics Laboratory
200 Shadylane Drive
Philipsburg, PA 16866

EQUIPMENT

Centrifuge Model: Drucker Model 642E/M
Rotor: 6-Place Horizontal
Test Tubes: BD Vacutainer 13mm x 100mm PST: Lithium Heparin
Analyzer: IL Flame Photometer

CENTRIFUGE SETTINGS

Speed: 3450 RPM as provided from factory
G-Force: 1,600 xg as provided from factory
Run Time: 10 minutes as provided from factory

ADDENDUM A

TEST DATA: JULY 2

SPECIMEN #	PRE-TRANSPORT POTASSIUM (MMOL/L)
1	4.08
2	4.16
3	3.81
4	3.88
5	3.68
6	3.99
7	4.03
8	3.94
9	3.68
10	4.15
11	3.95
12	4.15
13	4.14
14	4.09
15	3.98
16	3.82
17	3.86
18	3.96
19	3.83
20	4
21	3.64
22	3.64
23	3.64
24	3.77
25	3.92
26	4.49
27	4.49
28	4.24
29	4.1
30	4.01
Average	**3.97**
Correlation:	**96.82%**

TEST DATA: JULY 3

POST-TRANSPORT POTASSIUM (MMOL/L)	% INCREASE
4.22	3.43%
4.36	4.81%
3.87	1.57%
4.02	3.61%
3.79	2.99%
4.06	1.75%
4.06	0.74%
4.01	1.78%
3.8	3.26%
4.22	1.69%
3.96	0.25%
4.17	0.48%
4.16	0.48%
4.06	-0.73%
3.95	-0.75%
3.9	2.09%
3.96	2.59%
4.01	1.26%
3.92	2.35%
4.1	2.50%
3.75	3.02%
3.8	4.40%
3.74	2.75%
3.92	3.98%
4.1	4.59%
4.56	1.56%
4.56	1.56%
4.35	2.59%
4.18	1.95%
4.07	1.50%
4.05	**2.14%**