BD Barricor™ Scientific Forum

Webinar Series

BD Barricor™ Scientific Forum

Today, laboratories play an increasingly important role in the delivery of healthcare. The patient care journey often starts with a blood collection and the results based on those samples have a remarkable impact on the diagnostic process. Laboratories are facing many challenges to ensure that the highest quality of results are created in a timely manner to help enable the patient journey and achieve the best possible outcomes. To meet increasingly challenging targets, laboratories have already implemented numerous improvements such as automation and adoption of plasma for routine chemistry and immunochemistry among others.

The BD Vacutainer® Barricor™ blood collection tube enables the chemistry laboratory to respond to these growing challenges. The revolutionary mechanical separator creates, in as little as 3 minutes, a high quality, stable plasma suitable for a wide range of chemistry and immunochemistry applications. BD Barricor™ represents the biggest innovation in sample separation for over 30 years, making it the blood collection tube for the "lab of the future".

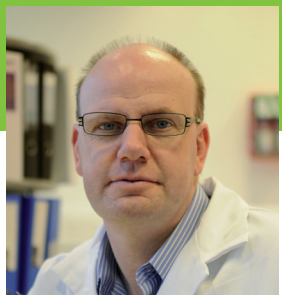
The revolution brought by BD Barricor™ can impact laboratories in many different ways and the opportunities that this product provide are applicable toa variety of laboratories. The BD Barricor™ Scientific Forum brings together current and future users of BD Barricor™ from across Europe to share their experiences regarding the routine use of this novel plasma blood collection tube.

We hope that today represents the opportunity to enhance your knowledge of BD Barricor™, discovering the impact that this tube has for your laboratory and your patients.

The BD Barricor™ Scientific Forum represented the opportunity for laboratory professionals to share to their knowledge of BD Barricor™, discovering the many impacts that this tube has for laboratories and patients! For those who missed the event, we are glad to announce the release of a series of webinars that you can access by the details on the link: http://lp.bd.com/Barricor-webinars.html

Andrea Negro, Ph.D.
European Product Manager

BD Vacutainer® Barricor™ Unveiling the True Possibilities of Plasma



Stephen Church

Associate Director Medical Affairs
BD Life Sciences
Preanalytical Systems

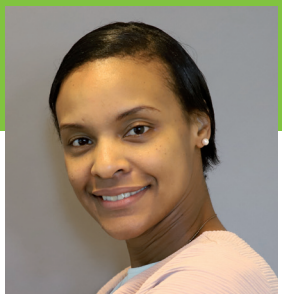
Duration: 25'52''

Laboratories face many challenges in enabling the delivery of accurate and timely results to the clinician in order to ensure patient care. Results need to be made available quickly, ensuring fast diagnosis but without unnecessary processing or reprocessing, enabling efficiency. Sample quality needs to be such that preanalytical influences are minimised to provide a high quality supernatant, which ultimately ensures an accurate in-vitro representation of the in-vivo state. Many current sample types and collection tubes can achieve some, but not all of these goals. BD has been researching different ways to stabilise and separate samples for many years. The culmination of this is the BD Vacutainer® Barricor™ Plasma Separation tube which combines the advantages of plasma with the new benefits of an inert mechanical separator. Unlike traditional gel-based separation technology, BD Barricor™ enables cellular sedimentation throughout the centrifugation cycle, enabling fast separation[1], reducing the levels of cells within the plasma[1] and thereby increasing the stability of cellular sensitive analytes from the traditional 1-2 days for plasma up to 7 days[2]. The inert nature of the separator means that analytes sensitive to interference from gel-based technology, such as therapeutic drugs, can also be tested using the same routine clinical chemistry sample[3]. BD Barricor™ provides a number of benefits over traditional separation technologies to provide a high quality sample enabling accurate and timely results.

References

1. BD White Paper VS9192, Evaluation of the Performance of the BD Vacutainer® Barricor™ Tube in Comparison with the BD Vacutainer® PST™ II Tube at Selected Centrifugation Conditions, 2016
2. Demeester, S., Lanckmans, K., Heyvaert, P., Weets, I, Martin, M, Stability of 21 Routine Chemistry Tests in the BD Barricor™ Tube and the Sarstedt S-Monovette® LH Tube up to 7 Days After Blood Collection, J Clin Chem Lab Med 1: 101. 2017
3. Steuer, C., Huber, A.R., Bernasconi, L, Where clinical chemistry meets medicinal chemistry. Systematic analysis of physico-chemical properties predicts stability of common used drugs in gel separator serum tubes, Clinica Chimica Acta 2016; 462:23-27, DOI: 10.1016/j.cca.2016.08.014

Improved Sample Stability with BD Barricor™



Dr. Chérina Fleming

Erasmus Medical Center
Rotterdam, The Netherlands

Co-Authors: Ina van Gorp and Dr. Christian Ramakers

Duration: 21'41"

Our 24/7 core routine laboratory recently transitioned from a predominantly serum workflow to a plasma workflow using BD's newest lithium-heparin Barricor tube. This tube contains a mechanical separator rather than the conventional gel separator. In our laboratory, samples are stored up to four days at 4°C in case additional test or verification of questionable results are requested by the physician.

Therefore, next to the SSTII vs BD Barricor™ comparison, we also investigated cold storage analytes stability of primary 5.5 ml Barricor tubes. In total, 66 analytes were analyzed immediately following centrifugation to obtain baseline (day T0) data, followed by measurements after 2 (T2) and 4 days (T4) of cold storage at 4°C. All measurements took place in the primary tubes, using residual material from T0. Results show that 63 out of the 66 analytes were within the a priori defined recovery range of 90-110% and therefore suitable for analysis on the fourth day of storage. Angiotensin-converting enzyme (ACE), complement C3 and human chorionic gonadotropin (HCG) showed a recovery of 119%, 112% and 116% respectively at T4 compared to T0. In conclusion, the lithium heparin plasma in the BD Barricor™ tube which is mechanically separated from the blood cells showed good stability for the majority of analytes after four days of refrigerated storage.

Achieving the best plasma sample quality

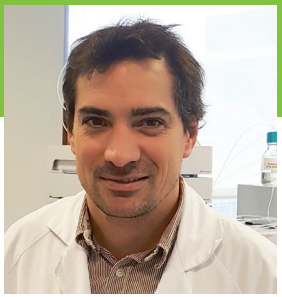
Dr. Andrea Padoan

Assistant Professor
Department of Laboratory Medicine University Hospital of Padova, Italy

Duration: 18'11"

The new BD Vacutainer® Barricor™ Plasma tube (BD Barricor™) has an innovative non-gel separation method, which is supposed not only to improve sample quality but also to improve turnaround time, thanks to the faster centrifugation condition. Plasma residual cell count was evaluated in BD Barricor™ using different centrifugation rates (1800g/10 min, 4000 g/3 min, 4000 g/7 min and 4000 g/15 min), with respect to the conventional BD Vacutainer® PST™ II Plasma tube (BD PST™ II), centrifuged at the recommended conditions (1300g/10 min). Forty donor samples, collected both by BD Barricor™ and by BD PST™ II were evaluated. The plasma obtained from the BD Barricor™ showed a significant reduction for WBC, RBC increasing the centrifugation force, even when BD Barricor™ was centrifuged at 4000 g x 3 min. Significant PLT differences were found for BD Barricor™ centrifuged at 4000g x 7 min and 4000 g x 15 min. In conclusion, plasma quality obtained using BD Barricor™ progressively improved with increasing centrifugation times. However, already at 4000g/3min, BD Barricor™ allowed a significant quality improvement compared to BD PST™ II, guaranteeing a faster centrifugation rate than BD PST™ II.

Separator gels barriers, mechanical technology or standard blood collection tubes?



Dr. Fabien Lamoureux

Rouen University Hospital, Department of Pharmacology – Toxicology and Pharmacogenetics

Co-Authors: Aurélien Schrapp, Tony Pereira, Duflot Thomas, Robinson Johannides, Laurent Imbert

Duration: 14'30''

The right blood collection tube for the right drug during therapeutic drug monitoring and toxicology screening procedures.

Background: Stability data of exogenous compounds such as toxics or drugs in gel-based separation or mechanical separator tubes are lacking, especially during therapeutic drug monitoring and clinical toxicology procedures. According to ISO 15189 accreditation standards, laboratories need to master the entire pre-analytical process including the stability of analytes in a given tube for a specific biological matrix and under given storage conditions in order to develop their quality management systems and assess their own competence.

Aims, Materials and Methods: The aim of this study was to explore the impact of BD Vacutainer® PST™ II and BD Barricor™ separator tubes on the stability of a panel of 157 therapeutic compounds and common drugs of abuse in plasma samples using LC-MS/MS.

Results: 39 drugs were significantly affected by the use of BD PST™ II collection tubes. These mainly included antidepressants, neuroleptics, cardiovascular drugs, anxiolytics, hypnotics and some drugs of abuse. A logP >2.5 was estimated as a cut-off value to predict a potent lack of drug stability in BD PST™ II gel tubes with a 89.3% sensitivity and a 61.2% specificity. Six compounds saw a non-significant reduction by the mechanical BD Barricor™ tubes: alimemazine, clobazam, imipramine, promethazine trimipramine, and sufentanil.

Discussion and conclusion: Determination of hydrophobic drugs with logP>2.5 should be carried out with caution in plasma samples withdrawn on separator tubes, neuroleptics and antidepressants are more impacted than others as reported in this study. Mechanical technology such as BD Barricor™ and/or non-gel blood collection tubes should be recommended for these drugs, according to the observed improvement of BD Barricor™ over BD PST™ II on drugs stability.

Advantages of Plasma: Challenging the myths around the use of plasma in laboratory testing

Dr. Kathrin Schlueter

Scientific Affair Manager
BD Life Science
Preanalytical Systems

Duration: 18’57’’

Today, many hospitals have already decided to convert their clinical chemistry samples from serum to plasma. The major advantage of using plasma is generally seen in short turnaround times (STAT), as the clotting time is eliminated. However, transport times are often regarded as sufficient to achieve the clotting of serum samples and so its elimination may only be beneficial for emergency or STAT samples. Short transit timesand other factors, like patient medication may prevent efficient clotting in serum samples, resulting in fibrin formation, process inefficiency and incorrect laboratory results. These factors do not impact plasma samples, latent clotting and its consequences are excluded. For some hospitals, the compatibility of their assays with plasma is a perceived barrier. While serum gel electrophoresis is indeed not compatible with plasma, assay manufacturers have developed more robust assays, offering almost all of their assays for both serum and plasma[1]. Also, an important analyte like potassium is tested more reliably in plasma. The stability of cell-sensitive analytes is dependent on the sample type. Highest stability was traditionally achieved with serum as it is virtually cell-free. However, mechanical separation of plasma leads to a “cleaner” sample with less cellular contamination, resulting in a plasma with serum-like stability[2,3].

References

1. Dubrowny, N. (2016). Raising awareness of assay compatibility with heparinized plasma. Clinical Chemistry and Laboratory Medicine (CCLM), 54(12), pp. e373-e374.
2. BD White Paper VS9295-1: Within-Tube Stability of Selected Routine Chemistry Analytes and Immunoassays in BD Vacutainer® Barricor™ Tubes in Comparison with BD Vacutainer® PST™ II and BD SST™ II Advance Tubes at Multiple Time Points Post Centrifugation
3. BD White Paper VS9377: Within-Tube Stability of Lactate Dehydrogenase in BD Vacutainer® Barricor™ Tubes with Dark Gray Stopper, BD Vacutainer® PST™ II and BD Vacutainer® SST™ II Advance Tubes

Switching from serum to plasma without tears

Dr. Christian Ramakers

Erasmus Medical Center
Rotterdam, The Netherlands

Duration: 26'38"

In their continuous strive to optimize sample processing many Dutch laboratories are highly automated, not only analytically but also pre- and post-analytically. While automation is an important step, optimizing the medium in which tests are analysed is also key. As such, the benefit of plasma over serum in automated labs is evident with an immediate processing step without any delay due to clotting of the sample.

Until recently our hospital (Erasmus MC, Rotterdam, The Netherlands) had not utilised plasma because of the sample logistics in place at that time, which allowed for ample clotting time of the serum tubes. With the opening of our new hospital in May 2018, almost 95% of transport of blood samples is going to be facilitated by an extensive pneumatic tube network allowing for a continuous and fast supply of blood tubes to the clinical laboratory. With this fast supply it is to be expected that there is an increase of after-coagulation of centrifuged standard serum tubes. The pre-emptive conversion to plasma would tackle this problem. While there were no tears, switching from serum to plasma is no walk in the park and involves meticulous planning and preparation. But with the support of BD and our hospital partners we were able to transition from a predominant serum-with-gel workflow to a lithium-heparin plasma workflow using the new BD Barricor™ tube for most of the routine 24/7 chemistry and immunochemistry tests. The switch to BD Barricor™ was realized on November 1st 2016 and is, up until this day a big success.

Attractive specifications of BD Barricor™ plasma blood collection tube for a biochemistry laboratory in a French University Hospital

Dr. Isabelle Benz de Bretagne

CHU of Tours, France

Co-Authors: Dr. Eric Piver

Duration: 12'59"

One of the performance indicators in clinical laboratory is the analytical Timearound Time (TAT). The pre-analytic phase is composed of registration, centrifugation and dispatching. BD has recently developped a new blood collection tube which could contribute to decrease the time of the pre-analytic phase.

Our motivations to change from BD SST™ and BD PST™ tubes to BD Barricor™ blood collection tube change were multiple:

1. to decrease the analytical TAT to improve patient care in hospital:
   a. by increasing the speed of our clinical chemistry testings and immunoassays on Cobas® 6000, Roche (with fewer tubes on board)
   b. by decreasing the duration of the pre-analytical process using a reduced time of centrifugation (3 minutes instead of 10 minutes).
2. to decrease the number of tubes collected per patient by consolidation (maximum of biological parameters analyzed on a same tube)

This change of tubes should not alter of course the quality of the results obtained for all biological parameters.

Before change, we performed an analytical comparison on 41 parameters between our routine tubes and the BD Barricor™ tube. A pilot clinical service was selected and for ten days an additional Barricor tube was collected for each patient. Statistical analyses performed on data obtained from this study showed an absence of differences. Thus, we modified our request form and informed each sampler service, of each site of the University Hospital of Tours (n = 5) and each hospital in our GHT (n = 5). The success of this change was possible thanks to the help of BD team.

Cobas® 6000 is a trademark of Roche Diagnostics

Building a BD Vacutainer® Barricor™ Business Case

Mr. Steve Coward

Belfast Health & Social Care Trust Belfast, United Kingdom

Duration: 23'13"

The use of BD Barricor™ tubes in Primary Care achieves a speed and durability of separation that is a generational improvement over 'traditional' gel containing tubes. Immediate separation and storage at 4°C overcomes many of the quality issues associated with intermittent transport and delayed separation, helps reduce pre-analytical error, and can introduce significant improvements in service delivery. However, there are obvious upfront costs by introducing centrifugation and refrigeration within General Practice surgeries, as well as operational, managerial and political considerations. There are obvious benefits with improved reliability of results leading to better care of patients, either by not initiating treatment where it is not required, and giving treatment when it is. The supposition that this will have cost benefits is there, but remains relatively intangible. Using the laboratory gains made from quality improvement by themselves, however, builds the business case for the introduction of BD Barricor™ with fast centrifugation/refrigeration. Using the reduction of both error and repeat analyses shows that the change may be cost neutral over a 7 year period whilst achieving the desired improvement in quality.

References
1. Investigation of potential quality improvements when using BD Vacutainer® Barricor™ for samples collected from Primary Care. Todd GM, Coward SM, McKeeman GC. 4th EFLM-BD European Conference on Preanalytical Phase Amsterdam (NL), 24–25 March 2017, Poster 12495
2. Investigation of potential quality improvements using BD Vacutainer® Barricor™ for Primary Care glucose samples. Coward SM, McKeeman GC, Todd GM. 4th EFLM-BD European Conference on Preanalytical Phase Amsterdam (NL), 24–25 March 2017, Poster 12494

BD Barricor™ Scientific Forum Webinars

BD Barricor™ User Experiences

BD Vacutainer® Barricor™ blood collection tube, thanks to its versatility, has an impact on several aspects within biochemistry laboratories. During this first session, our panel of experts has focused on the different uses of BD Barricor™ to improve laboratory processes: from sample stability to plasma quality, from efficiency to sensitive assays.

- *BD Vacutainer® Barricor™ Unveiling the True Possibilities of Plasma* - S. Church, BD, Winnersh (United Kingdom) – 25'52''
- *Improved Sample Stability with BD Barricor™* - Dr. C. Fleming, Erasmus MC, Rotterdam (The Netherlands) – 21'41''
- *Achieving the best plasma sample quality* - Dr. A. Padoan, University of Padova, Padova (Italy) – 18'11''
- *Separator gels barriers, mechanical technology or standard blood collection tubes? The right blood collection tube for the right drug during therapeutic drug monitoring and toxicology screening procedures* - Dr. F. Lamoureux, UTH Rouen, Rouen (France) – 14'30''

Converting to Plasma & BD Barricor™

Laboratory medicine has used serum as sample of choice for decades. Transitioning to plasma has several advantages, however it is still perceived a difficult barrier to overcome. BD Vacutainer® Barricor™ facilitates such transition thanks to its unique set of features. This session is focused on transitioning to the plasma sample and the impact that BD Barricor™ has in this switch.

- *Advantages of Plasma: Challenging the myths around the use of plasma in laboratory testing* - Dr. K. Schlueter, BD, Heidelberg (Germany) – 18'57''
- *Converting to Plasma Without Tears* - Dr. C. Ramakers, Erasmus MC, Rotterdam (The Netherlands) – 26'38''
- *Attractive specifications of BD Barricor plasma blood collection tube for a biochemistry laboratory in a French University Hospital* - Dr I. Benz de Bretagne, CHU Tours, Tours (France) – 12'59''
- *Building a BD Vacutainer® Barricor™ Business Case* - Dr S. Coward, Belfast University Hospital, Belfast (United Kingdom) – 23'13''

Check the BD Barricor™ Scientific Forum Website:
http://lp.bd.com/Barricor-webinars.html

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