

Urine vs. Blood Spot for Newborn Screening

	Dried Blood Spot Sample	Urine Sample
Sample Collection	The collection is by heel prick directly onto filter paper. Moderate or no pain.	Collection of a urine sample in a neonate is a painless process but It is NOT a simple one. The samples have higher chances of getting contaminated by fecal matter which affect results.
Sample Storage	Storage is much simpler. Blood samples can be stored at ambient temperature for much longer periods (7-10 days at room temperature).	Urine sample papers have to be stored under stringent conditions as the possibility of contamination is higher. Volatile analytes are lost.
Sample Rejection rate	Very low since dried blood samples are more robust and stable than urine.	The frequency of sample rejection is much higher because of following reasons: 1) Fecal contamination 2) Un-saturated filter papers 3) Un-adjustable creatinine
Sensitivity & Specificity	Close to 100% specificity and sensitivity as two different mass spectrometers are utilized for mass detection with the help of fragmentation. Results depend upon accurate mass detection of unique fragments in MS/MS.	Does not fragment the analytes before detection reducing the specificity.
Creatine Adjustment	Does not depend upon creatinine values. The analytes are directly quantified in blood. Thus the analyte concentrations are more reliable (semi-quantitative), leading to reproducible objective results from different operators.	It is the major factor to obtain reliable results. All analytes values depend upon the level of creatinine in urine which is highly variable, leading to subjective results from different operators.
Screening for FAODs	It is a very good platform for screening FAODs as the detection depends upon direct analysis of Acylcarnitines in a dried blood spot using TMS.	CANNOT screen for FAODs
Detection of CH, CAH and G6PD	Possible in Blood	Not possible in Urine
Throughput	500+ samples processed per day where the first screen is as efficient as the last screen (no compromise on quality, high throughput). Thus, a better screening tool.	Only 25-50 samples per day. Uses a column which accumulates non-volatiles and requires constant maintenance and cleaning. Definitely not a screening tool.
Statistical Data Availability & Cut offs	Vast amount of data and peer reviewed literature available from scores of globally established programs; cut-offs are easily available	There is not much data and literature available for urine GC/MS in India or globally and thus, cut-offs and individual expertise are not available.
International Standards	Universally followed guidelines and standards. Blood – TMS is the first line of screening universally (more than 75 programs worldwide).	Conventionally urine GC/MS is used as a confirmatory tool to establish diagnosis in cases screened positive by TMS.