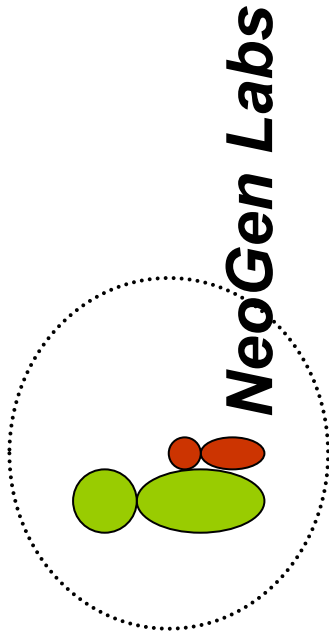


First Step

Newborn Screening Test

Giving babies the best start in life!



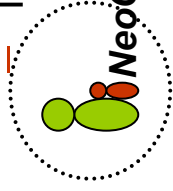
TECHNOLOGY FROM **PEDIATRIX**[®]
SCREENING

Why Screen Newborns?

Simple!

It Saves Lives

- Mandated for all babies born in the USA
 - Benefits of Screening Outweighs the Costs
 - Many US States use Tandem Mass Spectrometry
- Other Countries that offer NBS
 - Western European Countries
 - Philippines
 - Brazil
 - Australia
 - New Zealand



Importance of Newborn Screening

- **Early detection (within 72 hours) of Inborn Errors of Metabolism (IEM) allows treatment before symptoms develop**
 - Some treatments are inexpensive and may be a simple dietary change
 - Lead to children leading normal and healthy lives
- **If screening is not done and a disorder is not detected, it could lead to lifelong complications**
 - Mental Retardation
 - Motor Impairment
 - Physical Disability

Ayden - A Real Life Story ...



Disorder	G6PD
Consequences	Hemolytic Crisis
Symptoms	Rise of Body Temperature Yellow Coloring of Skin Dark Yellow-Orange Urine Heavy, Fast Breathing Weak, Rapid Pulse
Treatment:	Avoid Sulpha Drugs Rajma Beans Exposure to Naphthalene
Benefit:	Cannot get Malaria

First Step Newborn Screening Panel

- **Tandem Mass Spectrometer Based Tests**
 - Dried Blood Spot
 - 1 Test 42 Conditions
 - Highly Accurate
- **Biochemical Tests**
 - Dried Blood Spot
 - 1 Test 1 Condition
 - Focus on CH, CAH, G6PD, GALT, Cystic Fibrosis

Tandem Mass Spectrometer (MS/MS)

- **One Test Screens for Over 45 Inborn Errors of Metabolism**
 - Organic Acid Disorders
 - Fatty Acid Oxidation Disorders
 - Amino Acid Disorders
- **Technology is Based on Molecular Weights in a Dried Blood Sample**
- **Efficient and Economical**
 - About Rs. 3250 for 45+ conditions

Diseases Routinely Screened by First Step

- **Amino Acid Metabolism Disorders**
 - Phenylketonuria (PKU)
 - Maple Syrup Urine Disease (MSUD)
- **Fatty Acid Oxidations Disorders**
 - Medium Chain Acyl-CoA Dehydrogenase Deficiency (MCADD)
 - Short Chain Acyl-CoA Dehydrogenase Deficiency (SCADD)
- **Organic Acidemias**
 - Methylmalonic Acidemia (MMA)
 - Propionic Acidemia (PA)

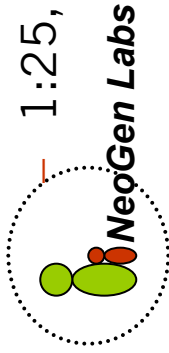
And, 45 more for less than Rs. 4000.

Incidence of IEMs

Collectively in India

~18:1000

- Galactosemia
 - 1:40, 000
- ASA
 - 1:70, 000
- CIT
 - 1:57, 000
- Homocystinuria
 - 1:150, 000
- MSUD
 - 1:100, 000
- PKU
 - 1:25, 000
- CUD
 - 1:100,000
- MCADD
 - 1:25, 000
- LCHADD
 - 1:75, 000
- TFPD
 - 1:100, 000
- VLCADD
 - 1:75, 000
- CbIA & CbIB
 - 1:100, 000
- GA-1
 - 1:75,000
- IVA
 - 1:100, 000
- MCD
 - 1:100, 000
- PA
 - 1:75,000
- G6PD
 - 1:66



Screening Process

Step 1: Heel Stick – Collect 3 - 5 drops of blood on a Filter Paper.

Step 2: Air dry the sample for 3 - 4 Hours. Do not stack or touch other surfaces.

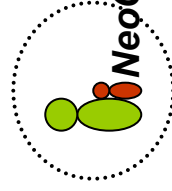
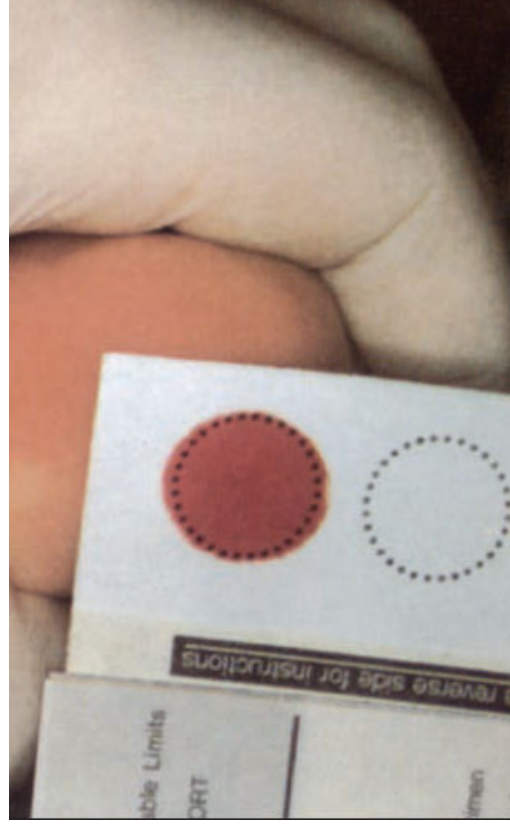
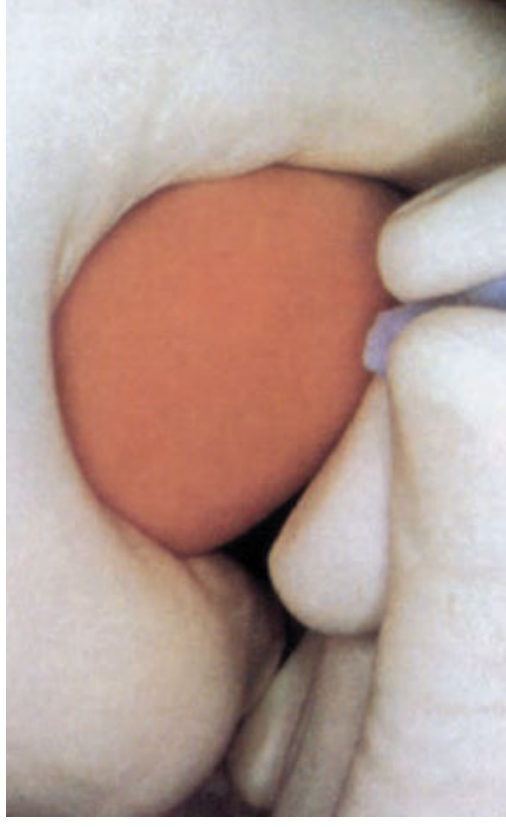
Step 3: Courier the sample to NeoGen Labs

Step 4: NeoGen prepares the sample and screens for 45+ metabolic disorders.

Step 5: NeoGen Labs communicates with the doctor within 48 hours, if positive screen. Within 10 business days, if negative.

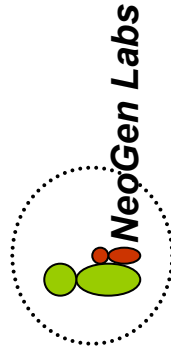
Heel Stick Technique

1. Puncture heel. Wipe away first blood drop with sterile gauze pad. Allow another **LARGE** blood drop to form.
2. Lightly touch filter paper to **LARGE** blood drop. Allow blood to soak through and completely fill circle with **SINGLE** application of **LARGE** blood drop. (To enhance blood flow, **VERY GENTLE** intermittent pressure may be applied to the area surrounding the puncture site). Apply blood to one side of filter paper only



NeoGen Labs

- **Focused on Newborn Screening Services**
- **Exclusive Technology Agreement with PEDIATRIX[®] SCREENING**
 - Exclusive Regions
 - Pioneered the use of Tandem Mass Spectrometry for Screening over 10 years ago
 - Over 3 Million Babies Tested, 300, 000+ babies tested every year
 - False Positive rate of less than 0.3%
- **The NeoGen Lab is situated in Bangalore**
 - Pediatrix Screening Lab in the US replicated at NeoGen
- **Milestones**
 - Validation Testing - Aug 2007
 - Commercial Operations - Sep 2007



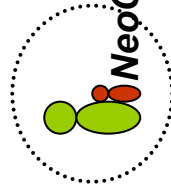
Positive Result

Wait!

There are a few more steps ...

Positive Results & Treatments

- **Confirmatory Test to be Done**
 - One Test, One Condition
 - Preferred Lab - 
 - Additional Cost
- **Doctors Treat Patients**
 - **NeoGen will not treat or suggest treatment**
 - Will provide resources to Doctors
 - Provide a list of IEM specialists that can help treat patients
 - Referrals to Treatment Centers and Genetic Counselors
 - NBS Websites
 - Articles & Journals
 - Support Groups
 - Research Organizations
 - Help with sourcing special diets for treating IEMs in India



Questions & Answers



Thank you for your time

Giving babies the best start in life!

