



## Newborn Screening ACT Sheet [Elevated C5 Acylcarnitine] Isovaleric Acidemia

### Differential Diagnosis:

- Isovaleric acidemia (IVA,)
- 2-Methylbutyrylglycinuria (2MBG) (also referred to as short/branched chain acyl-CoA dehydrogenase deficiency or SBCAD deficiency);
- Antibiotic-related (pivalic acid derived) artifact.

### Condition Description:

IVA and 2MBG result from different defects in the metabolism of the branched chain amino acids, leucine (isovaleryl-CoA dehydrogenase in IVA) and isoleucine (short/branched chain acyl-CoA dehydrogenase in 2MBG). In both conditions specific metabolites accumulate and are potentially toxic

### MEDICAL EMERGENCY: TAKE THE FOLLOWING IMMEDIATE ACTIONS:

- Contact family to inform them of the newborn screening result and ascertain clinical status (poor feeding, vomiting, lethargy, tachypnea, odor of sweaty feet).
- Consult with pediatric metabolic specialists
- Evaluate the newborn; if infant is ill, initiate emergency treatment as indicated by metabolic specialist and transport IMMEDIATELY to tertiary center with metabolic specialist.
- Initiate timely confirmatory/diagnostic testing as recommended by specialist.
- Educate family about signs, symptoms and need for urgent treatment of metabolic acidosis (poor feeding, vomiting, lethargy, tachypnea, odor of sweaty feet).
- Report findings to newborn screening program.

(See flowchart for information concerning the specific actions)

### You Should Take the Following Actions:

#### Diagnostic Evaluation:

Plasma acylcarnitine analysis confirms the increased C5. Urine organic acid. analysis will show isovalerylglycine in IVA and 2-methylbutyrylglycine in most cases of 2MBG. Urine acylglycine and acylcarnitine analysis may also be informative.

#### Clinical Considerations:

Isovaleric acidemia presents in the neonate with metabolic ketoacidosis, a "sweaty feet" odor, dehydration, hyperammonemia, ketonuria, vomiting, hypoglycemia, and failure to thrive. Milder variants without neonatal illness exist. Long term prognosis of IVA with appropriate therapy is good. The clinical spectrum of 2MBG is variable. To date, most patients identified by newborn screening with 2MBG are of Hmong descent and remain asymptomatic.

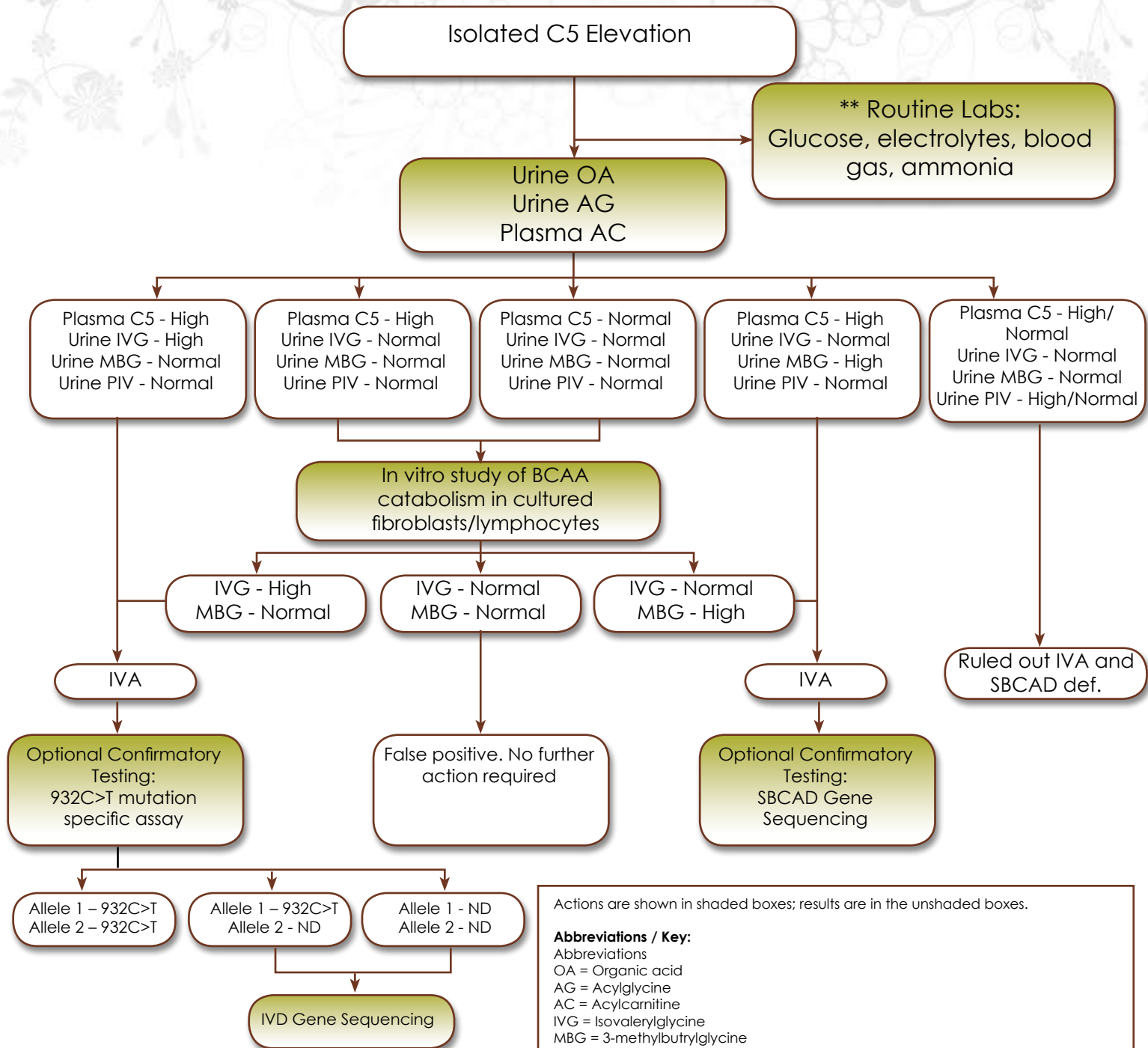
*Disclaimer: These standards and guidelines are designed primarily as an educational resource for physicians to help them provide quality medical services. In determining the propriety of any specific procedure or test, the healthcare provider should apply his or her own professional judgment to the specific clinical circumstances presented by the individual patient or specimen*



# NEWBORN SCREENING

Screening Today for a Safer Tomorrow

## C5 Elevated (Isolated)



Actions are shown in shaded boxes; results are in the unshaded boxes.

### Abbreviations / Key:

Abbreviations  
 OA = Organic acid  
 AG = Acylglycine  
 AC = Acylcarnitine  
 IVG = Isovalerylglycine  
 MBG = 3-methylbutyrylglycine  
 PIV = Pivalic acid (antibiotic)  
 IVA = Isovaleric acidemia  
 SBCAD = short/branched chain Acyl-CoA dehydrogenase

\*\* When the positive predictive value of screening is sufficiently high and the risk to the infant is high, some initiate diagnostic studies that are locally available at the same time as confirmation of the screening result is done.

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