

### **I am a parent. Should I get tested for G6PD deficiency?**

Yes, you may want to have yourself tested by requesting for G6PD assay using the confirmatory test in designated confirmatory centers. However, only males who are G6PD deficient and affected females (homozygous for G6PD) can be identified. A female with a carrier status (heterozygous for G6PD) cannot be detected by this kind of test.

### **I am trying to conceive. Should I be tested for G6PD deficiency?**

It is your choice if you want to be tested but the probability of having a child with G6PD deficiency does not solely depend on your status. Your spouse's G6PD status can also affect the probability of having a child with G6PD. It will be more practical to just have your newborn baby undergo the routine newborn screening after birth.

### **Where is G6PD Deficiency Confirmatory Testing done?**

The list of G6PD Confirmatory Centers can be found on pages 13-15 of this brochure, and online at [www.newbornscreening.ph](http://www.newbornscreening.ph)

### **Is formula milk safe for my son who has G6PD deficiency?**

Although soya and soy lecithin are both included in the list, many products contain very small amount of soya including the common milk formulas. There has not been any report of hemolysis due to milk products containing soya. Soy lecithin, which is present in different brands, is an important component of milk but it does not make up the whole milk. REMEMBER: Breastfeeding is still best for babies. Breastfeeding is healthier for both babies and mothers.

### **I am breastfeeding my son. When I haven't received the newborn screening result I ate the food that need to be avoided. Will they take effect on my son?**

Theoretically, food and chemicals can be excreted through the milk. If your son did not develop hemolysis due to that event in the past, then probably they were not excreted at all through the milk or the amount was too small to cause significant reactions.

### **I have donated blood several times without knowing I am a G6PD carrier. Can I still donate blood?**

Yes, you may still donate. There is no contraindication as a person with G6PD deficiency. There is also no policy written that you cannot donate.

### **Is it transmissible via blood transfusion?**

No, it is not transmissible via blood transfusion.

### **My baby has G6PD deficiency; vitamins are on the restricted list. How can I keep him healthy?**

Multivitamins are generally not contraindicated. Vitamin C or ascorbic acid can be given for as long as the dose is within the recommended dosage. Multivitamins are considered food supplements, BUT there is no substitute to nutritious, freshly prepared food and a well-balanced diet.

### **Is it okay to eat chocolates even if they have soy content?**

Although soya is included in the list, many products contain very small amount of soya. So generally patients with G6PD deficiency can eat chocolates except if it is a fava bean coated with chocolates. Please read the product label.

### **Is malunggay leaves safe to eat? Because I read in some website that malunggay isn't safe for people with G6PD deficiency.**

For as long as it is not included in the official list of NIH as foods to avoid, then there is no basis to withhold malunggay from persons with G6PD deficiency.

### **I have a son who has G6PD deficiency and now he has a cold and cough, it is safe to use oregano for his medication?**

Since oregano is not included in the list, it can be given. However, you should exercise caution in giving commercially produced herbal preparations because they might contain unreported chemicals. Generally, cough and colds can be treated with lots of fluids. If signs and symptoms persist or worsen, consult your doctor.

### **Is infant cereal safe for newborns with G6PD deficiency?**

So far, there are no reported cases of hemolysis secondary to rice infant cereals. It contains a very small amount of soya in the first place.

### **Is insect repellent safe to use?**

If you are not comfortable in using insect repellent, you can look for an organic type. If not available, you can just apply the commercial ones on your baby's clothes.

### **What toothpaste brand is safe for babies with G6PD?**

The amount of menthol that is in ordinary toothpastes so far has not caused hemolysis in patients with G6PD deficiency.

### **What about blueberries? In other countries, they are not listed as contraindicated food.**

If there is confusion about blueberries then it might be best to avoid it until extensive evidence that it is safe for patients

with G6PD deficiency becomes available. Please note that patients with G6PD deficiency are not the same all over the world because of differences in mutations and therefore phenotypes, some of them will react consistently with some of the items in the list and some would not.

### **What are the signs of hemolysis?**

Signs of hemolysis include tea colored urine, discoloration of the eyes and skin, weakness, and irritability. A child may look clinically pale but may actually have normal CBC results. So a CBC should be requested to confirm if the child has anemia.

### **My son exhibited symptoms of a viral infection (vomiting, lbm, lack of appetite). I saw on his diaper that the stain of his urine is somewhat tea colored. Should I be worried? What should I do?**

Bring him to his pediatrician for check up. Please do CBC APC, and urinalysis. Check for urine hemoglobin.

### **Have there been reported cases of hemolysis here in the Philippines because of G6PD deficiency? If so, what were the most common causes?**

Yes, there have been reports of hemolysis among patients with G6PD deficiency. There are also claims registered at PhilHealth. Some of the causes of hemolysis recorded in Philippine Children's Medical Center are infections (Flu, hepatitis) and exposure to moth balls. Fortunately, none of these patients died because of severe anemia. They were brought immediately to the hospital as soon as the initial signs of hemolysis became evident.

### **What are the chances of getting a different result if we undergo another Confirmatory Test?**

The family of a child confirmed with G6PD deficiency may always opt to have another confirmatory test if they are having doubts. If the result is below the borderline, the patient will most likely get a positive result in another test.

### **As a mom, can I use menthol-containing products?**

The use of menthol and camphor containing products are not recommended if the goal is to reduce or eliminate the pain. These products only divert attention away from the painful area by producing cooling effects and sensation on the skin. It is always better to know the real cause/s of the pain/discomfort by consulting your doctor about it.

### **Is there a contraindication to any vaccination for patients with G6PD deficiency?**

None.



# **G6PD** **Deficiency**

Glucose-6-phosphate dehydrogenase deficiency

[www.newbornscreening.ph](http://www.newbornscreening.ph)  
**Newborn Screening Reference Center,**  
National Institutes of Health,  
University of the Philippines Manila



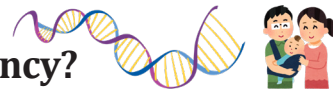
## What is G6PD Deficiency?

Glucose-6-phosphate dehydrogenase deficiency, or G6PD deficiency for short, is the most common enzyme deficiency worldwide. This is an x-linked inherited disorder which means that from the time a baby is born, there is already something wrong with how his body makes and breaks important substances.

According to statistics, about 400 million people have G6PD deficiency, and it is most common in Africa, Southeast Asia and the Middle East. In the Philippines, data from the Newborn Screening Reference Center as of 2024 showed that 1 out of 60 newborn Filipinos have Glucose 6 Phosphate Dehydrogenase deficiency.

Babies with G6PD deficiency have very little or no enzyme called Glucose-6-Phosphate Dehydrogenase (G6PD). An enzyme is a kind of protein that speeds up chemical reactions in the body. The enzyme G6PD is especially important to red blood cells. If this enzyme is lacking or missing, red blood cells are easily destroyed. Another name for G6PD deficiency is favism because some people who have it, usually those living in the Mediterranean region, react very badly after ingestion of fava beans.

## What causes G6PD Deficiency?



In order to understand what causes G6PD deficiency, one must first learn a bit about genes and chromosomes. Genes are like the body's blueprints. They contain instructions on how specific parts of the body are made.

For example, if the instructions in your hair genes say your hair is black, your hair will be black. Genes are packaged into threadlike structures called chromosomes. A chromosome is very much like a beaded bracelet. The beads are the different genes that give instructions for different parts of the body; the entire bracelet is the chromosome.

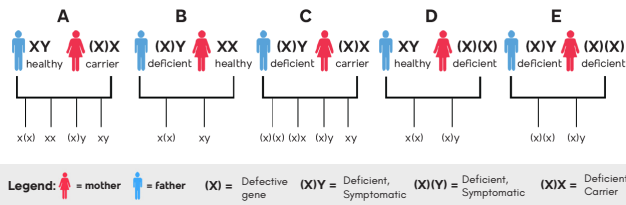
Genes usually come and act in pairs. One member of a specific pair comes from the father, and the other member comes from the mother. The members of a pair are located on paired chromosomes.

All normal human beings have 23 pairs of chromosomes. Each of the first 22 pairs contains the same number and kind of genes. The last and 23rd pair is the sex chromosomes. They are different from the first 22 pairs in that they do not have the same number and kind of genes. The sex chromosomes contain the genes that determine whether a baby will be a girl or a boy.

There are 2 kinds of sex chromosomes, X and Y. All baby girls have two X chromosomes. All baby boys have one X and one Y.

The gene that gives instructions on how G6PD is made is found in the X chromosome only, thus G6PD deficiency is described as X-linked.

If a baby girl gets one defective G6PD gene from either of her parents, she will not have G6PD deficiency because she has another G6PD gene that can do the work (remember: a baby girl has two X chromosomes, thus two G6PD genes). But if she gets two defective G6PD genes from both her parents, she will have G6PD deficiency. On the other hand, a baby boy whose G6PD gene is defective will surely get G6PD deficiency because the Y chromosome has no G6PD gene. A defective G6PD gene will give wrong instructions on how to make the enzyme G6PD. As a result, too little or none of it is made.



**Case A:** For every female child, there is a 50% chance that she will be a carrier, and 50% chance that she will be unaffected. For every male child, there is a 50% chance that he will be affected, and 50% chance that he will be unaffected.

**Case B:** Female children will be carriers, while the male children will be unaffected.

**Case C:** For every female child, there is 50% chance that she will be a carrier, and 50% chance that she will be affected. For every male child, there is 50% chance that he will be affected.

**Case D:** Female children will be carriers, while male children will be affected.

**Case E:** All children will be affected.

### What are the risks for individuals with G6PD deficiency?

G6PD has a very small but strategic role in protecting the body from substances that can cause damage to cells or oxidative substances. Because of this important role, G6PD is normally found in all parts of the body. To be sure, most parts of the body also keep a "spare" enzyme, one that can do the work of G6PD in case it is lacking or missing entirely. Unfortunately, this is not the case with red blood cells. They do not have spare enzymes that can do the work of G6PD. If a baby does not have enough G6PD, his red blood cells lack protection from the harmful effects of oxidative substances.

A baby with G6PD deficiency appears and remains healthy until he is exposed to a large amount of oxidative substances. When this

happens, his red blood cells are destroyed, a process known as hemolysis. Red blood cells carry oxygen to all parts of the body. When they undergo hemolysis, the baby will have hemolytic anemia. The signs and symptoms of hemolytic anemia are paleness, dizziness, headache, tea-colored urine, and abdominal or back pain or both. Hemolytic anemia, when very severe, can end in death.

Destroyed red blood cells are brought to the liver and spleen to be broken down to smaller pieces for disposal. One of the end products of this process is bilirubin, a yellowish substance that accumulates in different parts of the body when too much of it is produced. Quite often, bilirubin accumulates in the skin and causes it to appear yellowish. In the worst cases, bilirubin accumulates in the brain and causes intellectual disability or death.

### Where do oxidative substances come from?

Hemolysis of red blood cells will only occur IF and WHEN a G6PD deficient child is exposed to oxidative substances. Oxidative substances are found in certain drugs, foods, and beverages.

The body also produces oxidative substances during severe infections or illnesses such as typhoid fever, pneumonia, or kidney failure. Most drugs with strong oxidative effects are of these kinds:

1. antibiotics of the sulfa group
2. medicines for malaria
3. some medicines for fever



For a more detailed list of drugs, food, and beverages with strong oxidative substances, please refer to page 9-12.

### How is G6PD deficiency treated?

When a child has taken oxidative substances and suddenly shows the signs and symptoms of hemolytic anemia, he is said to have a hemolytic crisis. During such crisis, the goal of doctors and nurses is to prevent the harmful effects from getting worse. Blood transfusion, oxygen, and folic acid may be given. The ultimate treatment for G6PD deficiency is gene therapy (replacing a defective gene with a good one), but this is not yet available at the present time.

### As parent, what should I do to prevent a hemolytic crisis?

1. Tell your child's pediatrician that your child has G6PD deficiency. This is very important so that he will not prescribe oxidative drugs in case your child gets ill. He would also be able to watch out for hemolytic crisis and would immediately know what to do just in case it happens.

2. Keep your list of oxidative substances in a handy place. Better yet, post it in a convenient spot on the kitchen wall. Always double-check food, beverage, and medicine labels against the list.

3. Memorize the signs and symptoms of hemolytic anemia: paleness, dizziness, headache, difficulty in breathing, rapid and strong heartbeats, tea-colored urine, and abdominal or back pain. Bring your child to his pediatrician as soon as these signs and symptoms appear.

4. Do not ignore infections. Persistent fever signals an infection. Bring the child at once to his pediatrician.

5. As your child gets older, honestly and gently tell him about his condition and teach him to be careful about what he eats.

### My baby did not go through newborn screening. What should I do to make sure that he/she is not G6PD deficient?

You can bring your child to a pediatrician for a thorough medical check up. If the age of your baby is already beyond the limit for newborn screening, he/she can still undergo confirmatory testing for G6PD deficiency. However, for the other diseases included in the newborn screening, it will depend on the assessment of your pediatrician if your baby will need a referral to a specialist (i.e. endocrinologist, metabolic geneticist, hematologist, pulmonologist) for further evaluation.

### My baby has G6PD deficiency and I feel devastated. Did I do something wrong when I was pregnant? Could I have done something while I was pregnant for my baby to avoid it?

You did nothing wrong. It is a genetic disorder, hence, there is nothing you can do as a mother to prevent it.

### My firstborn was diagnosed with G6PD deficiency. I am pregnant again and worried – will my next baby also have it?

Once you have a child with G6PD deficiency, there is always a possibility of having a child with G6PD deficiency for every succeeding pregnancies. All your babies must undergo newborn screening.

### Even if tested positive by Newborn Screening Test, is it possible that the confirmatory test of my child is negative?

Yes. If negative, then you do not have to worry about the medicines and the food items. If positive, make sure that your attending physician knows that your child has G6PD deficiency.

**REGION 4B**

**10 Palawan Medical Mission Group Multipurpose Cooperative Hospital**, Corner Burgos Mabini Street, Brgy. Princesa, Puerto Princesa City, Palawan, 09989565102

**NCR**

**11 Manila Central University- Filemon D. Tanchoco Medical Foundation, Inc.**, Samson Road, EDSA, Caloocan City, Metro Manila, (02) 8363 3084

**12 Dr. Jose Fabella Memorial Hospital**  
San Lazaro Compound, Tayuman Street, Sta. Cruz, City of Manila, Metro Manila (02) 8866 7960 to 74 loc 125

**13 The Medical City**  
Ortigas Avenue, Pasig City, Metro Manila  
(02) 8988-1000 / (02) 8988-7000 Ext. 2284 / 2403

**14 University of Perpetual Help Dalta Medical Center**  
Alabang Zapote Road Pamplona III, Las Pinas City  
(02) 8874 8515 loc 152

**REGION 5**

**15 Bicol Regional Hospital and Medical Center**  
Rizal St. Legazpi City, Albay  
(052) 483 1088; 483 0806

**16 Bicol Region General Hospital and Geriatric Medical Center**, San Pedro, Cabusao, Camarines Sur  
09637045263

**REGION 6**

**17 West Visayas State University Medical Center**  
E. Lopez St., Jaro, Iloilo City  
(033) 320 2431 loc 108/138

**18 Doctor Pablo O. Torre Memorial Hospital**  
B.S. Aquino Drive, Barangay 5, Bacolod City, Negros Occidental, 0998 846 0620

**REGION 7**

**19 Cebu Doctors' University Hospital**  
Osmeña Boulevard Capitol Site, Cebu City  
(032) 255 5555 local 122 or 123

**20 Gov. Celestino Gallares Memorial Medical Center**  
M. Parras St., Tagbilaran City, Bohol  
(038) 411 4868 to 69 loc 293

**21 Silliman University Medical Center**  
V. Aldecoa Sr. Road, Daro, Dumaguete City  
0920 441 7264

**REGION 8**

**22 Eastern Visayas Medical Center**  
Brgy. 93 Bacagay, Tacloban City  
(053) 832 5309

**REGION 9**

**23 Brent Hospital and Colleges Inc.**,  
R.T. Lim Boulevard, San Jose Cawa-Cawa, Zamboanga City  
0917 189 1349

**REGION 10**

**24 Cagayan De Oro Polymedic Medical Plaza**  
Kauswagan Highway, Cagayan De Oro City  
09688523615

**25 La Vina General Hospital, Inc.**  
L. Alkuiro St. Poblacion, Valencia City, Bukidnon  
09976058050

**26 Mayor Hilarion A. Ramiro Sr. Medical Center**  
Maningcol, Ozamiz City  
(088) 521 0440

**REGION 11**

**27 Tagum Doctors Hospital Inc.**  
Highway 5A Rabe Subd. Barangay Visayan Village, Tagum City, Davao Del Norte, 09195451830

**28 Davao Medical School Foundation Hospital**  
Medical School Dr, Poblacion District, Davao City, Davao del Sur, 0926 688 7834

**REGION 12**

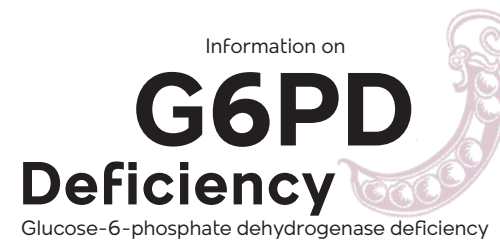
**29 General Santos Doctors Hospital**  
National Highway, General Santos City  
09338162793

**30 Kidapawan Doctors Hospital Inc.**  
Ninoy Aquino Road, Brgy. Lanao, Kidapawan City  
(064) 523 0121 loc 508, 0998 996 1471

**REGION 13**

**31 Surigao Doctors Hospital, Inc.**  
Sitio Kinabutan, Brgy. Rizal, Surigao City  
(086) 827 5177 / 0951 453 8661

This is an informational material given to all patients who will undergo G6PD confirmatory testing, whether deficient or not. While waiting for the result, avoid the foods and drugs listed in this brochure.



Version:  
**NSRC-PSU-FS-66/rev2**

Published by  
**NEWBORN SCREENING REFERENCE CENTER**  
National Institutes of Health  
University of the Philippines Manila  
E-mail: info@newbornscreening.ph  
Website: www.newbornscreening.ph

**I. DRUGS TO BE AVOIDED**

Drugs	Generic name
<b>A. Antibacterial</b>	*nalidixic acid nitrofurantoin 1. nitrofurantoin 2. furalozidone 3. nitrofurazone/nitrofurantoin *P- aminosalicylic acid
<b>B. Analgesic/ Anti-pyretic</b>	*acetanilid
<b>C. Anthelmintic</b>	*B-naphthol *niridazole *stibophen
<b>D. Sulfonamides and Sulphones</b>	dapsone glibencamide/glyburide *glucosulphone sodium *mafenide acetate *salicylazosulphapyridine/ sulfasalazine stibophen sulphacetamide/sulfacetamide *sulphadimidine *sulphafurazone sulphamethazole/sulfamethazole sulphanilamide/sulfanilamide sulphapyridine sulphoxone/sulfoxone salazosulphapyridine
<b>E. Antimalarials</b>	chloroquine *pamaquine primaquine pentaquine
<b>F. Miscellaneous</b>	acetylphenylhydrazine dimercaprol flutamide isobutyl nitrite mepacrine phenazopyridine probenecid thiazolesulfone urate oxidase/ rasburicase

\*Not available in the Philippines    \*\*Should be water soluble

## II. CHEMICALS TO BE AVOIDED

methylen blue
arsine
phenylhydrazine
toluidine blue
trinitrotoluene
aniline dyes

## III. FOOD/DRINKS TO BE AVOIDED

fava beans	
red wine	
legumes	abitsuelas, garbanzos, peas, mung bean
blueberry	
soya food	taho, tofu, soy sauce
tonic water	
bitter melon / ampalaya	

## IV. OTHERS

menthol	pain relief gel pain relief oil mentholated oil mouthwash
camphor	liniments
naphthalene	moth balls
parabenzene dichloride / dichlorobenzene	toilet deodorizer
henna	
herbs	cattle gallstone bezoar honeysuckle flower chimonanathus flower 100% pearl powder figwortflower acalypha indica

## V. DRUGS SAFE TO TAKE IN THERAPEUTIC DOSES

Generic name
acetaminophen
paracetamol
acetophenetidin/ phenacetin
ascorbic acid
chloramphenicol
ciprofloxacin
diphenhydramine
isoniazid
phenytoin
quinidine
**vitamin k analogues / phytomenadione

\*Not available in the Philippines    \*\*Should be water soluble

## IMPORTANT REMINDERS FOR PATIENTS WITH G6PD DEFICIENCY



1. Avoid ingestion of or exposure to the listed drugs and chemicals.
2. If you have cough, colds, or other bacterial or viral infections, make sure to inform your doctor that you have G6PD deficiency.
3. If you have ingested or were exposed to any medication and your urine became tea-colored, inform your doctor immediately.
4. If you have yellowish discoloration of skin, sclera or any part of your body, consult your doctor immediately.

## G6PD Deficiency Confirmatory Centers

### CAR

- 1 **Baguio General Hospital and Medical Center**  
1 Gov Pack Road Baguio City  
(074) 661 7985 loc 4110

### REGION 1

- 2 **Ilocos Training and Regional Medical Center**  
Barangay Parian, San Fernando City, La Union  
(072) 607 6418 loc 158 or 159
- 3 **Mariano Marcos Memorial Hospital and Medical Center**  
Brgy. 6 San Julian City of Batac, Ilocos Norte  
0917 168 8856
- 4 **Region 1 Medical Center**  
Arellano St., Pantal, Dagupan City, Pangasinan  
(075) 515-8916 loc 744

### REGION 2

- 5 **Cagayan Valley Medical Center**  
Dalan na Pagayaya, Carig Sur, Tuguegarao City, Cagayan  
(078) 302 0000 loc 1015

### REGION 3

- 6 **Angeles University Foundation Medical Center**  
Mac Arthur Highway, Angeles City, Pampanga  
0930 499 3138
- 7 **Bataan General Hospital and Medical Center**  
Manahan St., Tenejero, Balanga City, Bataan  
(047) 237 1275 loc 6704

### REGION 4A

- 8 **University of Perpetual Help Dr. Jose G. Tamayo Medical Center- Binan**, Old National Highway, Sto. Niño, Biñan City, Laguna, (049) 544 5150
- 9 **St. Anne General Hospital**  
P. Gomez Ext., Red-V, Ibabang Dupay, Lucena City, Quezon,  
09228985922; (042) 7103506; 7102218