How is EB Diagnosed?
– Skin Biopsy
– DNA Mutation
– Prenatal Diagnosis

Skin Biopsy for EB

When EB is suspected, a skin biopsy should be taken to confirm the diagnosis and identify the type of EB. The skin biopsy must be taken from a new blister. This is best performed on an area of skin where the physician has tried to induce a blister by rubbing the skin with a pencil eraser.

Based on the results of the skin biopsy, genetic testing may be performed to confirm the specific gene and DNA mutation(s) present. In a small number of people, DNA mutation analysis is unable to identify the specific mutations that are suspected to be present based on the results of the skin biopsy.

To perform the skin biopsy, the physician will use an anesthetic to first numb an area of skin. Then, the physician will take a small sample of skin for examination. Sometimes, two smaller samples may be taken. The skin samples must be processed for specific studies, immunofluorescence antigen (IFA) mapping and transmission electron microscopy (EM).

Immunofluorescence antigen mapping is performed to identify exactly where the blister has occurred and which proteins are involved (absent or diminished in amount). This is a specialized study that should be done by a pathologist in a laboratory that specializes in this procedure.

Examples of such laboratories include:

Beutner Labs, Inc.
3580 Harlem Road
Buffalo, NY 14215
1-800-288-0549
http://www.beutnerlabs.com/contact/

Stanford Dermatopathology Service
Department of Pathology – H2110
Stanford Medical Center
300 Pasteur Drive
Stanford, CA 94305
650-723-6736
http://dermatopathology.stanford.edu/contact.html

DNA Mutation Analysis

Molecular genetic studies (DNA analysis) may be done after the subtype of EB has been confirmed by skin biopsy. Molecular studies are done to identify the specific genetic mutation and to determine the mode of inheritance (recessive vs. dominant). This information is helpful for family planning and

makes prenatal diagnosis of subsequent pregnancies possible. DNA analysis for all subtypes of EB is available through:

GeneDx
207 Perry Parkway
Gaithersburg, MD 20877
301-519-2100
www.genedx.com

Prenatal Diagnosis

After an EB diagnosis has been confirmed by skin biopsy and molecular genetic studies (DNA analysis), prenatal diagnosis of future pregnancies becomes possible.

These steps are required for prenatal diagnosis of EB:

1. Biopsy diagnosis of an affected family member is needed to identify EB subtype.
2. After subtype is identified, DNA sample is sent to lab for identification of the genetic mutation.
3. After genetic mutation is identified, amniotic fluid or chorionic villus sampling (CVS) is obtained during pregnancy, sent to the genetic laboratory and evaluated for the previously identified mutation. Placental cells may be obtained through a CVS, performed at approximately 10-12 weeks gestation, and amniotic fluid may be obtained through amniocentesis, at approximately 15-18 weeks gestation.

Many EB parents prefer to have prenatal diagnosis completed utilizing CVS rather than amniocentesis.

Preimplantation genetic diagnosis (PGD) improves the likelihood of an EB-free birth. PGD is accomplished by genetic analysis of a fertilized egg before implantation.

The process is as follows:

1. DNA analysis is performed to identify the genetic mutation present in the affected person.
2. Hormone injections to the prospective mother to stimulate her ovaries for development of eggs.
3. The eggs are retrieved from the mother and fertilized with the father's sperm in the physician's office, usually by a reproductive endocrinologist (in vitro fertilization).
4. When the fertilized egg has developed into at least eight cells, one cell is removed and analyzed in the laboratory to determine whether it carries the genetic mutation present in the affected person.
5. If the mutation is not detected, the fertilized eggs are implanted in the mother's womb in anticipation of the birth of a child who does not have EB.

This procedure has resulted in successful outcomes for many EB families, but it is expensive. With proper documentation and, in some instances, after multiple appeals, it has been reported that insurance has covered the procedure.