

Hemophilia A

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MEDICINE AND GENOMICS

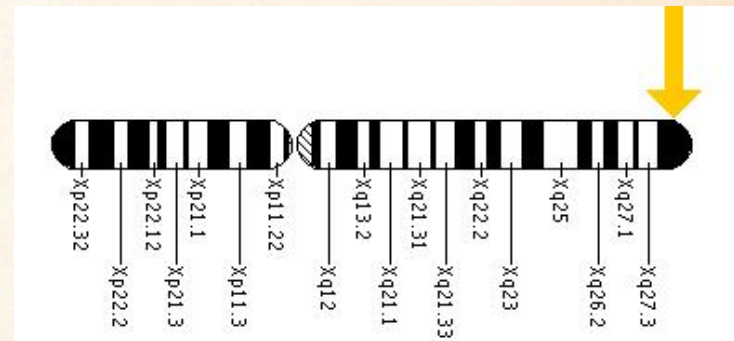
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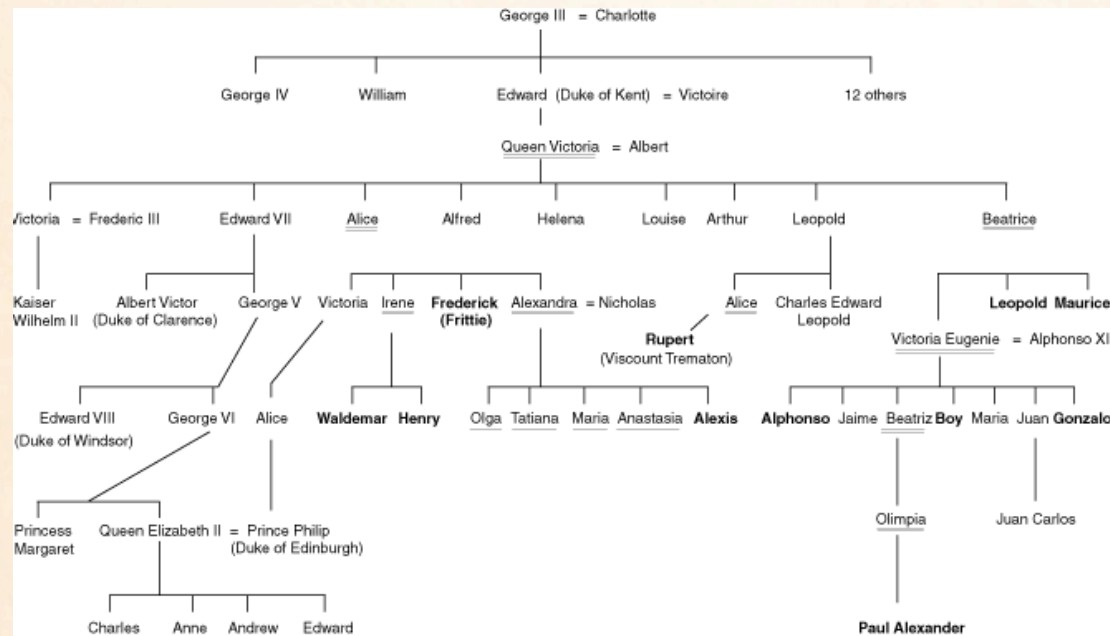
Hemophilia?

- **Characteristics:**

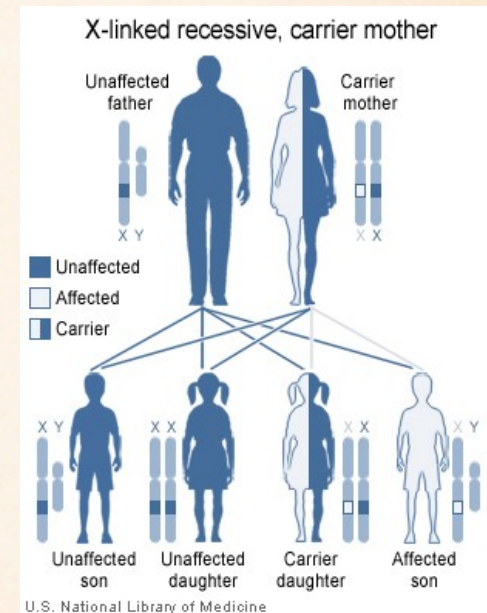
- ❖ swelling in the muscles
- ❖ internal bleeding and hematuria
- ❖ hemorrhages in the joints: necrosis, contractures, neuropathy
- ❖ inherited bleeding disorder: lack of the protein Factor VIII
- ❖ can also be caused by mutations on HEMA F8 gene
- ❖ X-linked, recessive disease: typically affects males



The Royal Disease



European royal family pedigree indicating instances of hemophilia. Bold denotes hemophiliac male. Double underline denotes hemophilia carrier female. Single underline denotes possible hemophilia carrier female. [Reproduced from Stevens, R.F. (1999) *British Journal of Haematology* 105:25-32., with permission.]



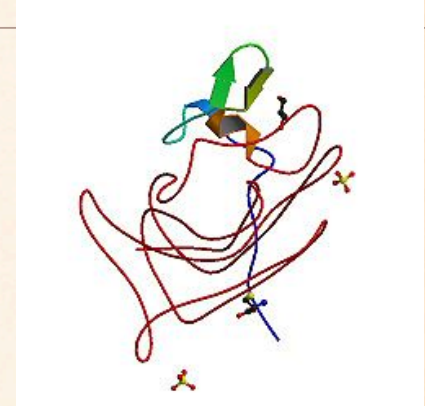
Diagnostic Methods

- ❖ Mild to severe cases: depends on presence of Factor VIII
- ❖ Look for intracranial bleeding, deep-muscle swelling, prolonged nosebleeds
- ❖ Platelet counts and coagulation tests
- ❖ Molecular genetic testing for Factor VIII



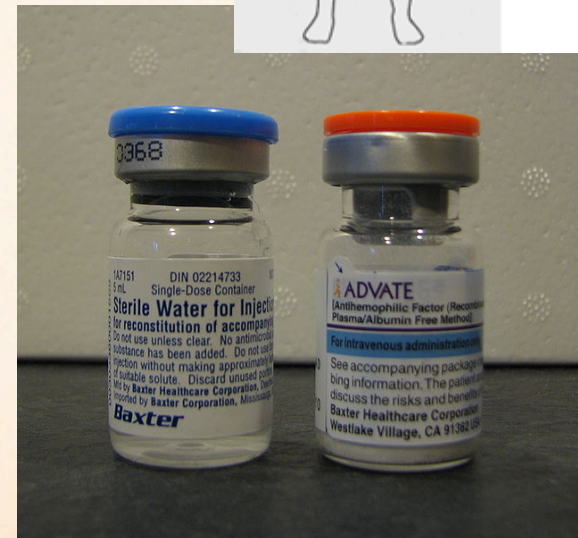
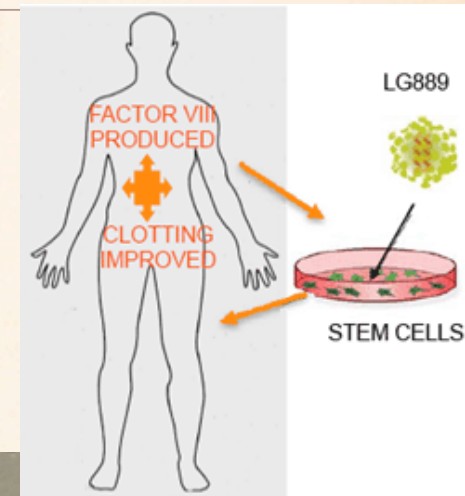
Treatment

- ❖ Aspirin during Queen Victoria's time
- ❖ Preventative medicine
- ❖ Prophylactic infusion
- ❖ Desmopressin acetate is used to treat small bleeds
- ❖ More severe wounds: clotting factors must be replaced
- ❖ Prior to the 1980s: blood donations
 - ❖ led to HIV infected hemophiliacs



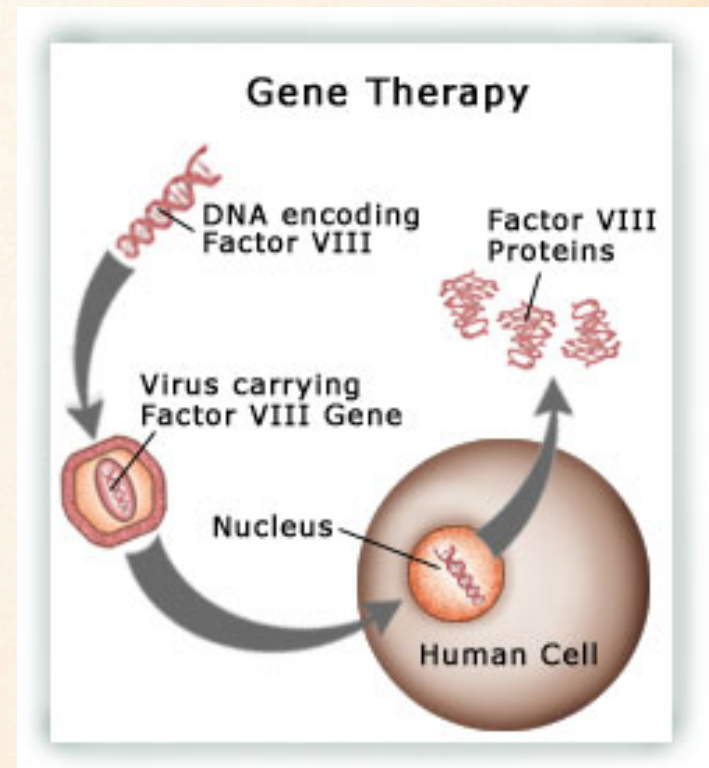
Novel diagnosis

- ❖ Patients receive recombinant clotting factors
- ❖ Gene replacement therapy is still in its clinical stage
- ❖ Replacement therapy:
 - ❖ risks: development of inhibitors, viral infections, damages to the joints



Where are we heading?

- ❖ Scientists were working on creating retroviral vectors that insert Factor VIII gene into DNA of cells: not yet perfected
- ❖ Unfortunately, complications and failures have caused gene therapy for hemophilia A to be discontinued



Sources

- ❖ NCBI: Gene Reviews

- ❖ <http://www.ncbi.nlm.nih.gov/books/bv.fcgi?highlight=hemophilia&rid=gnd.section.95>

- ❖ OMIM

- ❖ <http://www.ncbi.nlm.nih.gov/entrez/dispomim.cgi?id=306700>

- ❖ Wikipedia

- ❖ <http://en.wikipedia.org/wiki/Haemophilia>

- ❖ Images:

- ❖ wikipedia: Hemophilia

- ❖ google.com