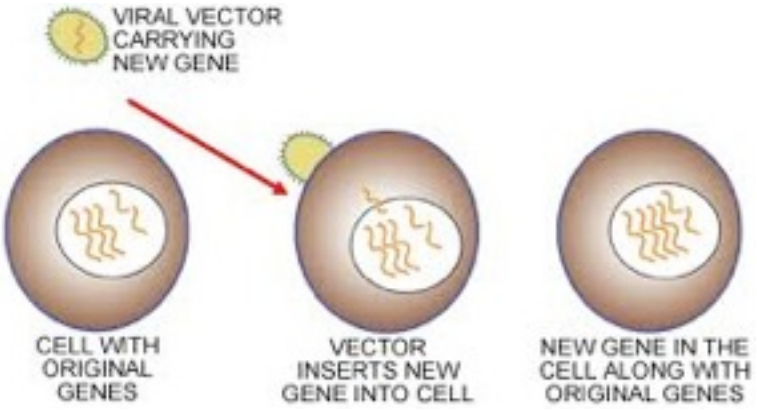
Three other types of genetic engineering

Somatic gene transfer therapy



Process- Cells with defective genes are removed from the patient (though this stage is not always necessary) , and a replacement gene is introduced into the defective cell, so that the new healthy gene is added to the old ones. Hopefully, as the defective cells are replaced they will then be replaced will the form of a new healthy cell.
Benefits- The treatment is non-invasive and its medical potential is huge.
Dangers- The altered cells could possibly mutate and cause unexpected problems. The therapy still only treats symptoms, not causes and can only work for the individual sufferer. (The latter was more of a limitation)

Germline Therapy

Process- The same principles are used here, apart from the gametes or sex cells are altered. Through this change the new healthy cells are passed on to the next generation. N.B- this is currently illegal.
Benefits- Genetic disorders could be eradicated completely. The process is carried out on adults and there should be no complications regarding new healthy cells being passed on to following generations.
Dangers- Do we have the right to change genetic information without consulting those affected? Can we really know how these modified cells will react with others during the natural process of reproduction? Your offspring would technically have three parents as the DNA had to come from a non-sufferer. Could this lead to the production of 'designer babies'? And would this lead to the creation of two very different human species, designer and non-designer.

Pre-Implantation Genetic diagnosis and selection (PGD)

Process- Involves the use of embryos produced through IVF. A single cell gets removed from the embryo and tested for genetic disorders. If the embryo is free of the genetic disorder it is implanted, but if it comes back testing positive for the genetic disease, then it is not implanted. This is currently a HFEA regulated process.
Benefits- It ensures that children are born without inherited illnesses. Would stop so many abortions taking place as it allows parents to know if their children have inherited diseases much earlier in their pregnancy. It could also allow the child born through PGD to save a sibling with a genetic disorder, a so-called ' saviour sibling'
Dangers- It can lead to the destruction of embryos found to have genetic disorders. At the moment only certain disorders are included in HFEA guidelines. Again, it could lead to designer babies. The procedure is complicated and risky. Bad for saviour sibling's self esteem.