**INDICATIONS FOR CYTOGENETIC ANALYSIS:**

**(Α) CLINICAL INDICATIONS FOR CYTOGENETIC PRENATAL DIAGNOSIS (Amniotic fluid, chorionic villi, fetal blood)**

1. previous livebirth with a chromosome abnormalty;
2. previous stillbirth with a potentially viable chromosome abnormality;
3. parental chromosome rearrangement, chromosome mosaicism or sex chromosome aneuploidy;
4. positive maternal serum screening result indicating an increased risk of a chromosomally abnormal fetus;
5. increased maternal age;
6. abnormal fetal ultrasound;
7. resolution of possible fetal mosaicism detected by prior prenatal study;
8. risk of chromosome instability syndrome

**(Β) CLINICAL INDICATIONS FOR INVESTIGATION OF CONSTITUTIONAL KARYOTYPE (Peripheral blood, bone marrow, fibroblasts)**

**Significant family history of:**

1. chromosome rearrangements;
2. mental retardation of possible chromosomal origin where it is not possible to study the affected individual.

**Patient with:**

1. primary or secondary amenorrhea or premature menopause;
2. sperm abnormalities - azoospermia or severe oligospermia;
3. clinically significant abnormal growth - short stature, excessive growth, microcephaly, macrocephaly;
4. ambiguous genitalia;
5. abnormal clinical phenotype or dysmorphism;
6. multiple congenital abnormalities;
7. mental retardation or developmental delay;
8. suspected deletion/ microdeletion/ duplication syndrome;
9. increased risk for a microdeletion syndrome due to a positive family history;
10. X-linked recessive disorder in a female;
11. clinical features of a chromosome instability syndrome, including isolated haematologic findings;
12. monitoring after bone marrow transplantation;
13. a malformed fetus or stillbirth of unknown etiology;
14. third and subsequent consecutive miscarriage(s) or products of conception from the fetus.

**Couple with:**

1. chromosome abnormality or unusual variant detected at prenatal diagnosis;
2. unbalanced chromosome abnormality in the products of conception;
3. child with a chromosome abnormality or unusual variant;
4. infertility of unknown etiology.

**(C) FLUORESCENE IN SITU HYBRITIZATION**

**Metaphase FISH**

Evaluation of:

1. marker chromosome;
2. unknown material attached to a chromosome;
3. rearranged chromosomes;
4. suspected gain or loss of a chromosome segment;
5. mosaicism.

**Interphase FISH:**

Evaluation of:

1. numerical abnormalities;
2. duplications;
3. deletions;
4. rearrangements;
5. sex chromosome constitution;
6. mosaicism;
7. gene amplification.

**Rapid Prenatal FISH**

1. High risk of chromosome abnormality e.g. abnormal ultrasound.
2. Late gestation referral.

**(D) CLINICAL INDICATIONS FOR CANCER CYTOGENETICS (bone marrow, peripheral blood)**

1. Acute leukaemia: at diagnosis. If an abnormality is present, follow up after treatment or at relapse may be indicated. If an abnormal clone is not detected, re-investigation at relapse may be indicated;
2. Myelodysplasia (MDS): at diagnosis, especially in the BMT eligible patient. Follow up may be indicated at disease progression and after treatment;
3. Chronic myelogenous leukaemia (CML): at diagnosis. Follow up may be indicated for staging purposes or to monitor therapy efficiency;
4. Other chronic myeloproliferative neoplasms (MPN): at diagnosis in selected cases, to rule out CML and to assess for possible acute leukemic transformation;
5. Malignant lymphoma and lymphoproliferative disorders (LPD): at diagnosis in selected cases;
6. CLL (FISH only) for prognostic indications.