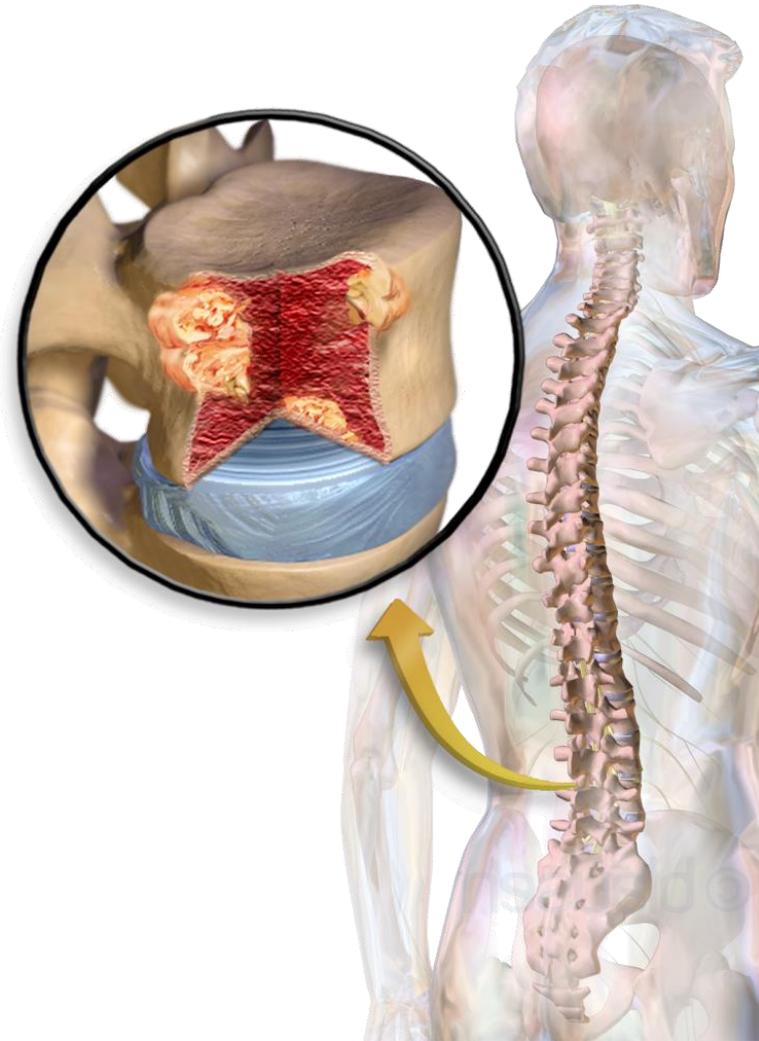





The Life Saving Cord Blood Bank



Stem Cells and Multiple Myeloma





What is Multiple Myeloma

- Multiple Myeloma is a cancer of your plasma cells, a type of white blood cell present in your bone marrow
- Plasma cells normally make proteins called antibodies that help you fight infections
- In Multiple Myeloma, a group of plasma cells (myeloma cells) becomes cancerous and multiplies, raising the number of plasma cells to a higher than normal level. Since these cells normally make proteins (antibodies), the level of abnormal proteins in your blood also may go up
- Health problems caused by multiple myeloma can affect your bones, immune system, kidneys and red blood cell count



Etiology

- No cause for myeloma has been identified.
- Possible associations with a decline in the immune system,
- Exposure to certain chemicals, and exposure to Ionizing radiation.
- Exposure to herbicides, insecticides, petroleum products, heavy metals, plastics, and various dusts including asbestos
- Genetic factors
- multiple myeloma is most likely the result of several factors acting together.
- Associated with chronic infections-HIV and osteomyelitis and chronic inflammatory disorders like Rheumatoid Arthritis



Signs and symptoms

- Bone pain (60%)- back or chest
- Reduction in height
- Weakness and fatigue (32%)
- Weight loss (24%)
- Pallor
- Radiculopathy- thoracic or lumbosacral area
- Infection- 45% of deaths w/i 60 days of diagnosis



Stages of Myeloma

Stage I (low cell mass):

Early disease. The bone structure appears normal or close to normal on x-ray images; the number of red blood cells and amount of calcium in the blood are normal or close to normal; and the amount of M protein is very low.

Stage II (intermediate cell mass):

An intermediate stage between stage I and stage III.

Stage III (high cell mass):

More advanced disease. One or more of the following are present:

- Anemia
- A high level of calcium in the blood
- More than 3 areas of advanced lytic bone lesions (destructive holes in the bones)
- A high level of M protein in the blood or urine.



Epidemiology

- Multiple myeloma comprises 10% of all haematological malignancies and 1% of all neoplastic disorders.
- 1.9 per 100 000 for men and 0.4 to 1.3 per 100 000 for women.
- Delhi has the highest incidence.
- The American Cancer Society estimates that multiple myeloma will be diagnosed in 21,700 people during 2012.

Ref: KUMAR et al. : Recent Advances In The Management Of Multiple Myeloma; The National Medical Journal Of India Vol. 19, No. 2, 2006

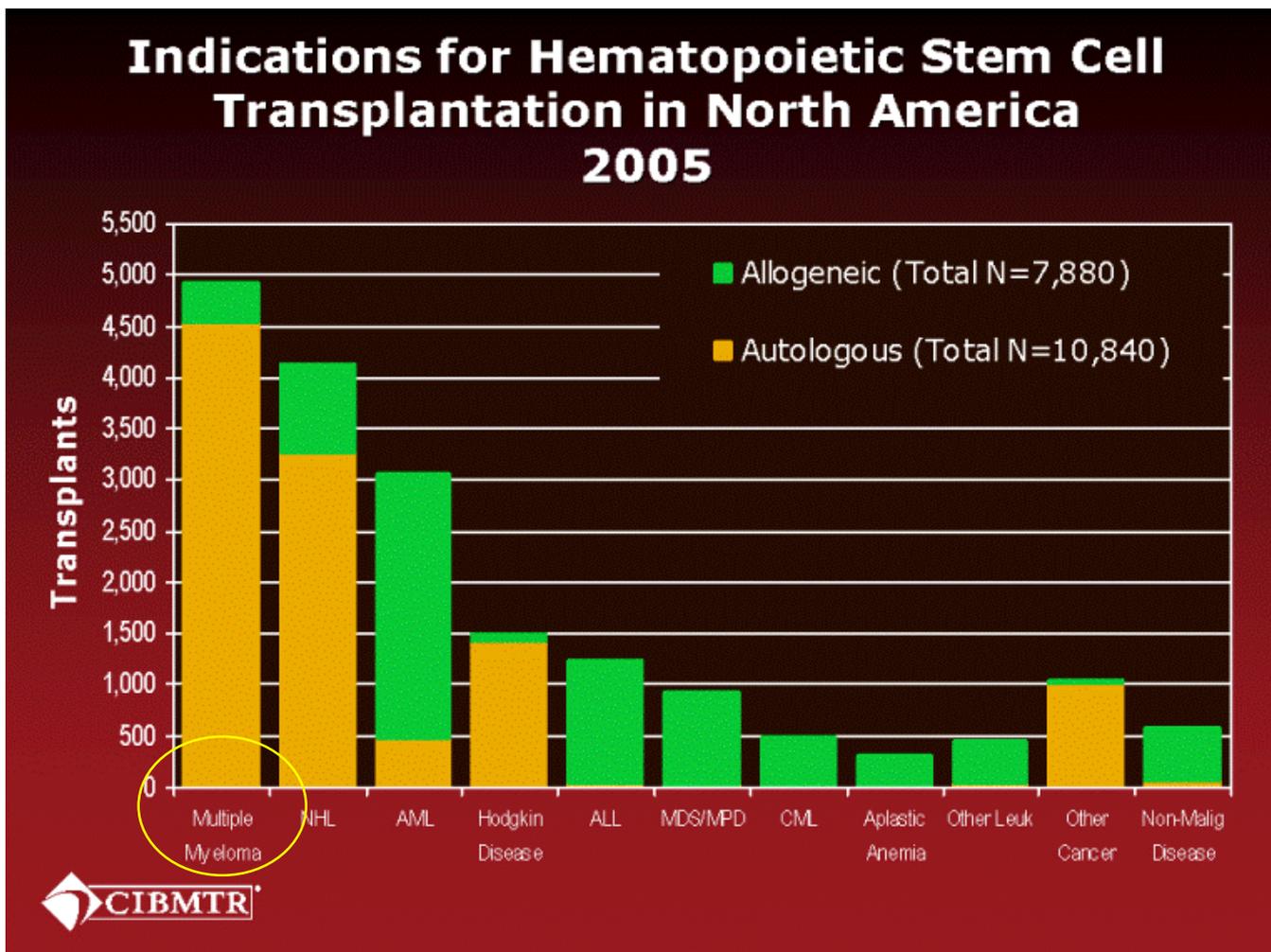


How is Myeloma diagnosed?

- People suspected of having multiple myeloma will usually need to have the following tests done :
- blood and urine tests, looking for evidence of paraproteins (abnormal immunoglobulin fragment).
- X-rays or scans of the bones are also performed to determine if there are any areas of bone that have been weakened or eroded by the myeloma cells.
- A bone marrow biopsy — a test that involves taking a small sample of bone marrow, which is examined under a microscope to look for myeloma cells



Indications for Haematopoietic Stem Cell Transplantation





What is stem cell transplantation?

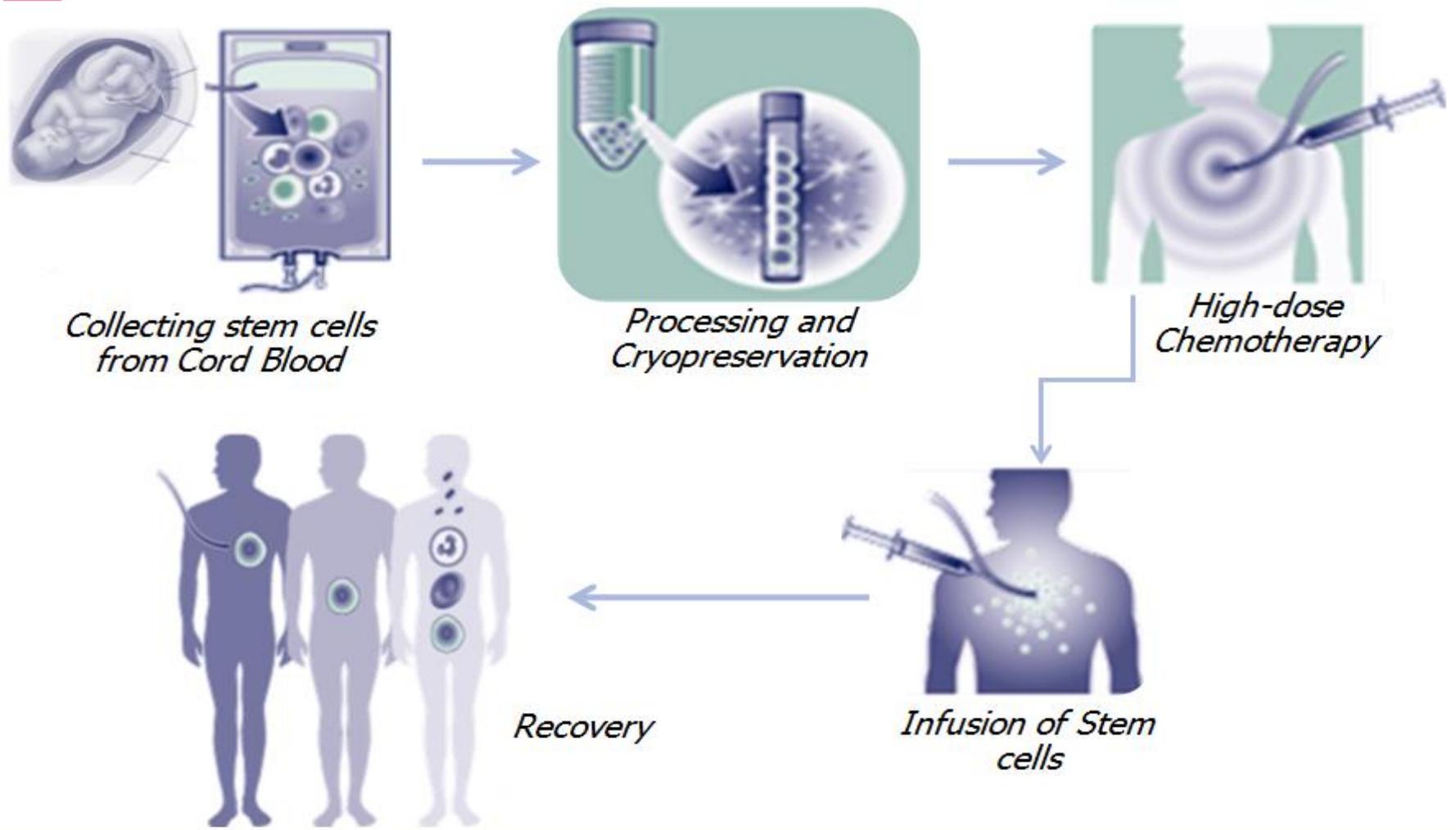
A stem cell transplant infuses healthy blood-forming stem cells into the body. Stem cells can be collected from the bone marrow or umbilical cord blood.

There are two main types of stem cell transplants:

- **Autologous stem cell transplant:** In this type of stem cell transplant, stem cells are collected from the patient themselves. The stem cells are removed from the patient's blood, harvested, frozen and stored until needed, then given back to the patient after he/she has received high dose chemotherapy and/or radiation therapy to destroy the cancer cells.
- **Allogeneic stem cell transplant:** In this type of transplant, stem cells are taken from a matching donor. Donors may include a relative/family member (e.g., sibling). To determine if a donor's stem cells are the right match, the patient undergoes a human leukocyte antigens (HLA) test. In an HLA test, we compare the patient's blood and tissue type with blood samples from the donor.



Stem cell transplantation for Myeloma





Stem cell therapy for Myeloma- Results

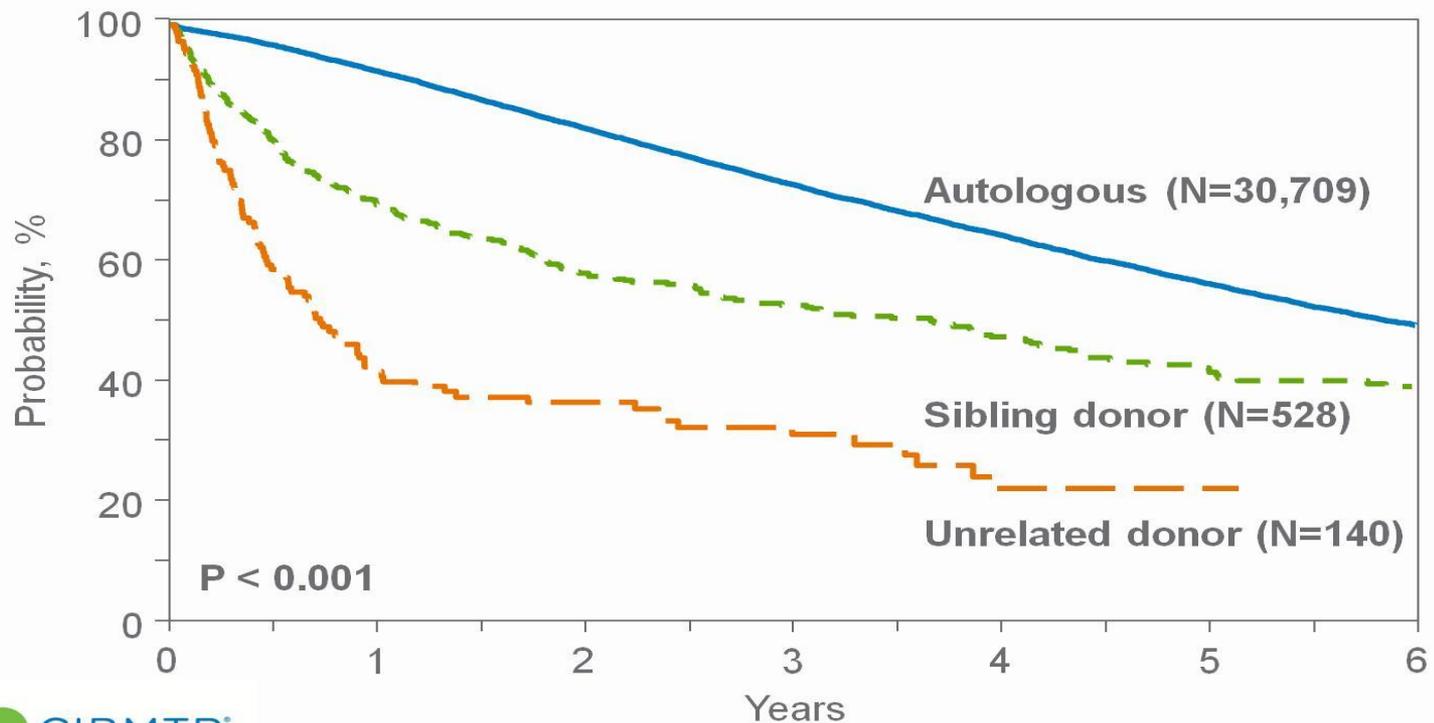
- Multiple myeloma is the most common indication for autologous HSCT.
- Among 30,709 patients who received an auto transplant for MM between 2001 and 2011, the 3-year probability of survival was 72% \pm 1%.
- Allogeneic transplantation for MM is reserved for patients with high risk disease and the majority performed after an autologous HCT with reduced intensity or nonmyeloablative conditioning regimens.
- Among the 668 patients who received an allogeneic HCT from 2001 to 2011, the 3-year probabilities of survival were 52% \pm 2% and 31% \pm 4% for recipients of HLA-matched sibling and unrelated donor grafts, respectively.

Ref: CIBMTR; http://www.cibmtr.org/Studies/ClinicalTrials/BMT_CTN/Protocols/Pages/0102.aspx



Stem cell therapy for Myeloma- Results

Survival after Transplants for Multiple Myeloma, 2001-2011



By Donor Type

42



Single versus Double Autologous Stem-Cell Transplantation for Multiple Myeloma

Michel Attal et al; N Engl J Med 349;26 www.nejm.org december 25, 2003

We conducted a randomized trial of the treatment of multiple myeloma with high-dose chemotherapy followed by either one or two successive autologous stem-cell transplantations.

CONCLUSIONS

As compared with a single autologous stem-cell transplantation after high-dose chemotherapy, double transplantation improves overall survival among patients with myeloma, especially those who do not have a very good partial response after undergoing one transplantation.



Multiple Myeloma and stem cells- video links

[Video on Multiple myeloma & Stem Cells](#)



THANK YOU

