





**OUR EXPERIENCE WITH AUTOLOGOUS STEM
CELL APPLICATIONS IN CHRONIC NON HEALING
ULCERS OF LOWER LIMB**

BY:

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OUR INSTITUTION



VEER SURENDRA SAI MEDICAL COLLEGE & HOSPITAL, BURLA, ODISHA

FOOT ULCERS

- **Leg and foot ulcers are common**
- **Chronic non healing ulcers due to non specific causes of**
 - arterial**
 - venous**
 - neurogenic**
 - metabolic (Diabetic)**

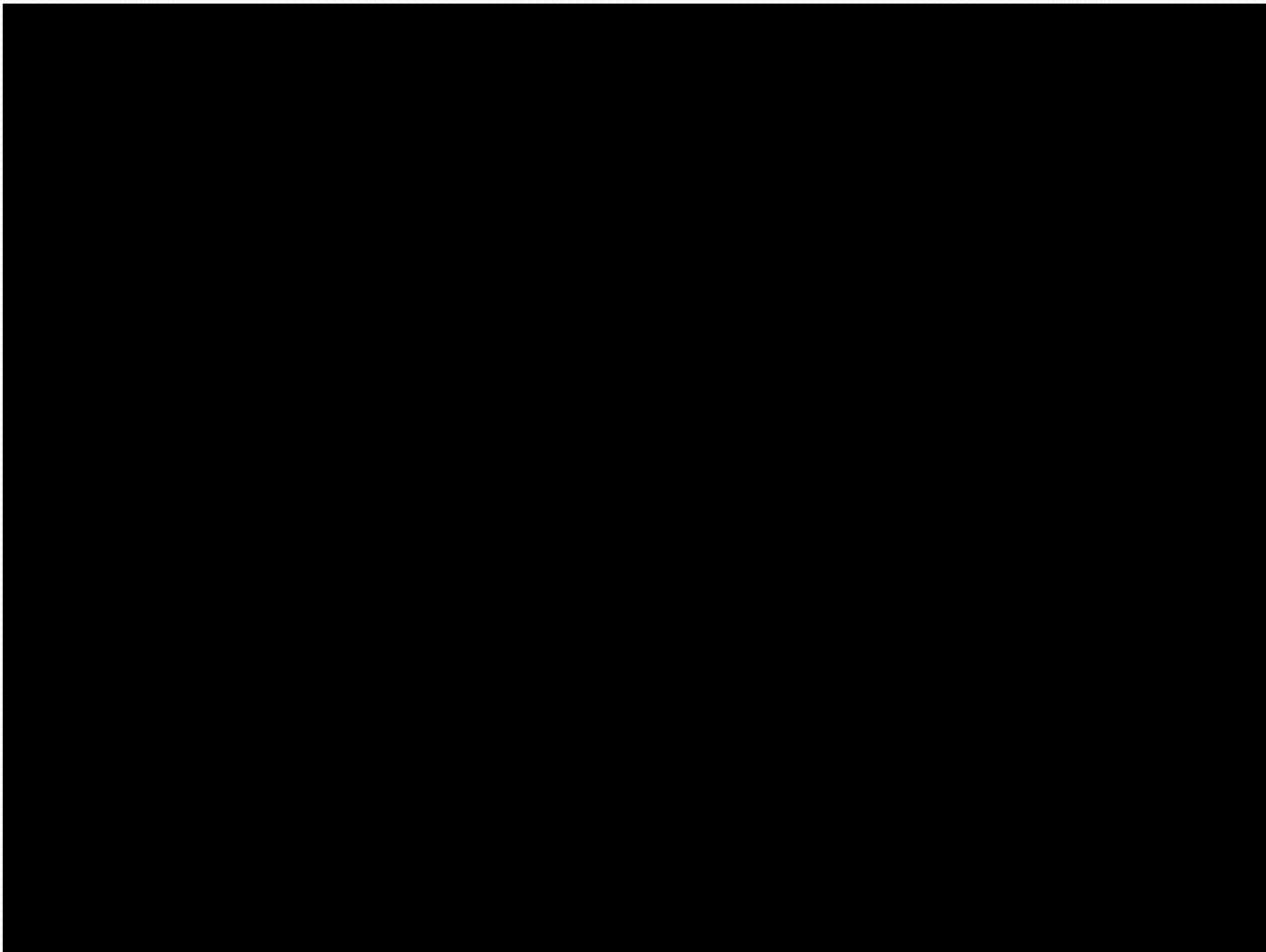
are usually refractory to treatment, even with the best available treatment today, because of persistent etiological factors.

AIM & OBJECTIVE

- **We present here our experience of autologus bone marrow derived stem cell therapy to chronic non healing ulcers of varied etiology such as**
 - Diabetes**
 - Sickle cell disease**
 - Buerger's disease(PVD)**
 - Hansen's disease**
 - Burn injury with ulcer etc.,****which are refractory to conventional methods of management.**

DIABETIC FOOT ULCERS

- A chronic systemic disease involving almost all systems.
- Leads to neuropathy, microangiopathy causing ulceration after minor trauma.
- Glucose laden tissue favours the spread of infection.
- Ulcer prone for delayed healing, non-healing, chronicity, gangrene, graft failure, recurrence & limb loss
- In this study we avoid these complications by using cell therapy.



DIABETIC FOOT ULCER VIDEO 1

MATERIALS AND METHODS

- Clearance of institutional ethics committee was obtained.
- A thorough search of literature was done on related topics before the study.
- Informed consent of the patient was taken before the study.

INSTITUTIONAL ETHICS COMMITTEE
S.O.B MEDICAL COLLEGE, CUTTACK-753 007
[ORISSA]

CHAIRPERSON: *Dr. ...*
MEMBER SECRETARY: *Dr. ...*

MEMBERS: *Dr. ...*

DATE: *10/06/2019*

NAME OF THE STUDY: *Study on the effect of ...*

NAME OF THE INVESTIGATOR: *Dr. ...*

APPROVED: Approved Not approved Approved with suggestions

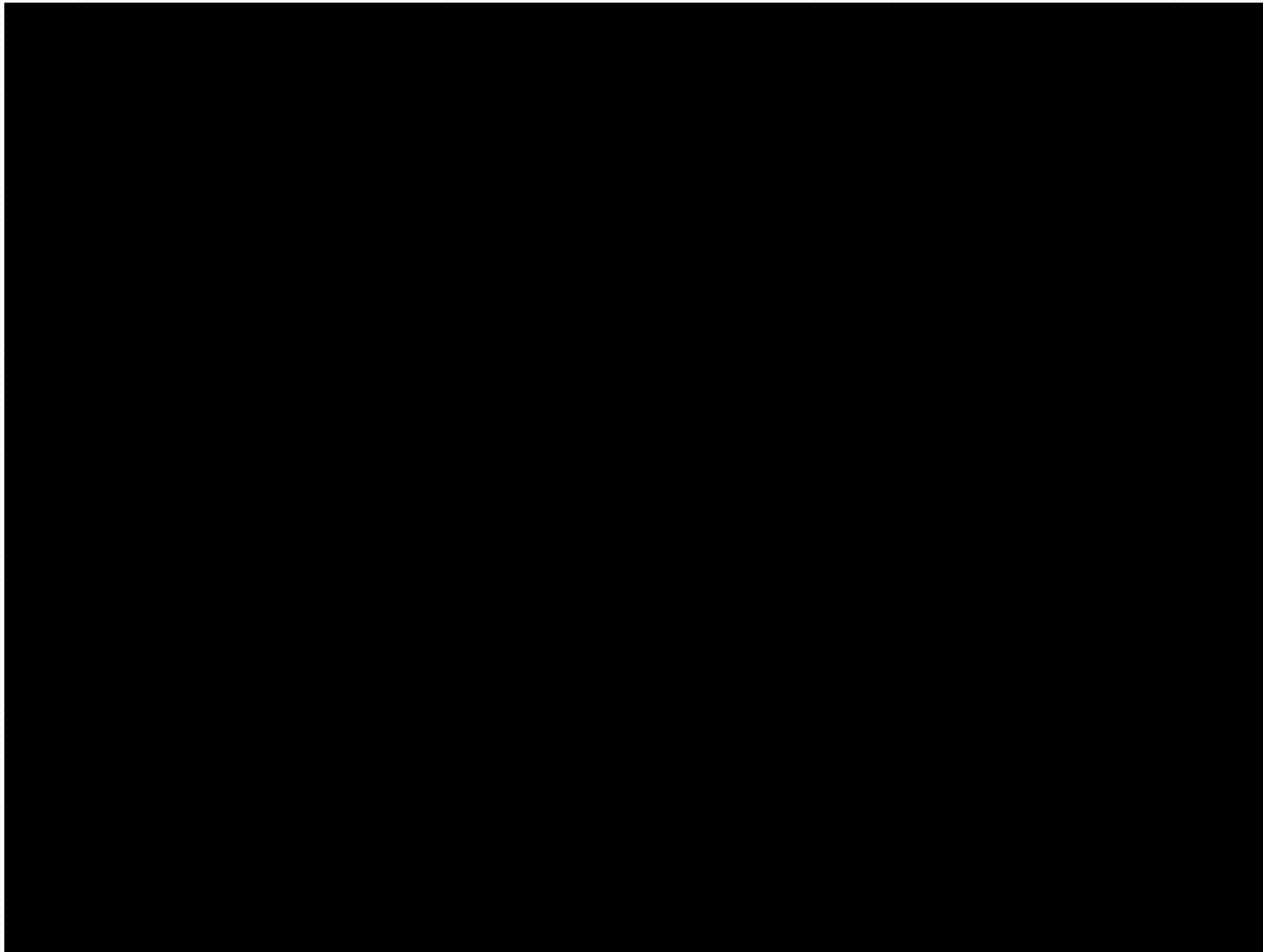
DATE OF REVIEW: *10/06/2019*

DATE OF NEXT REVIEW: *10/06/2020*

RECOMMENDED FOR APPROVAL: *Yes (Three years)*

Dr. ...
Dr. ...

BONE MARROW HARVEST



VIDEO 2

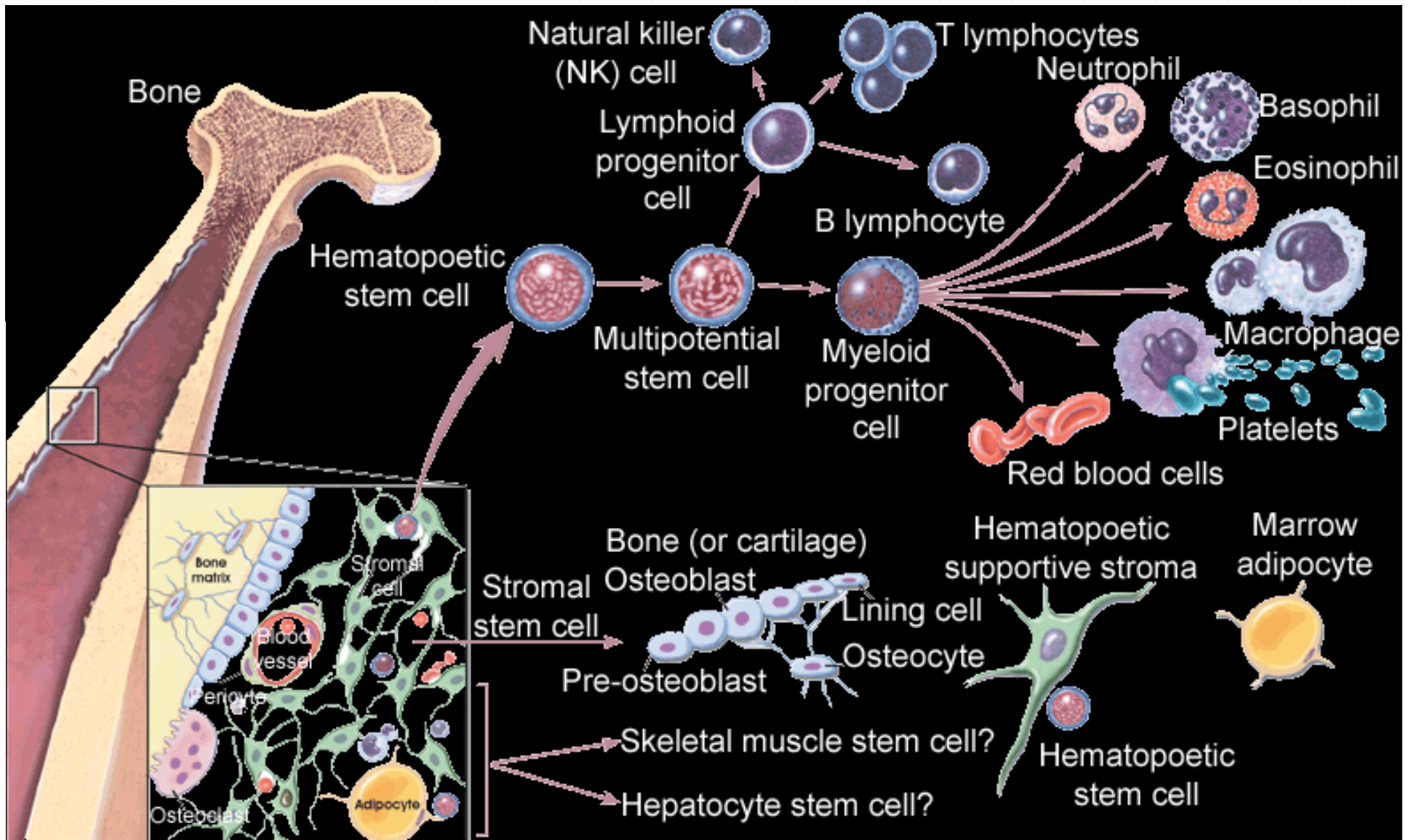
METHODS

- **Bone marrow was harvested from patients' sternum or iliac crest under aseptic conditions**
- **The harvested marrow was then centrifuged with buffered Ficol medium**
- **The mononuclear cell layer was pipetted out and injected to the ulcer base, floor, margin , edge and surrounding tissues of the ulcer site**
- **Healing of ulcer and appearance of granulation tissue were observed**

Stem Cell

- A cell that has the ability to continuously divide and differentiate (develop) into various other kind(s) of cells/tissues

BONE MARROW STEMCELLS



ADULT STEM CELLS

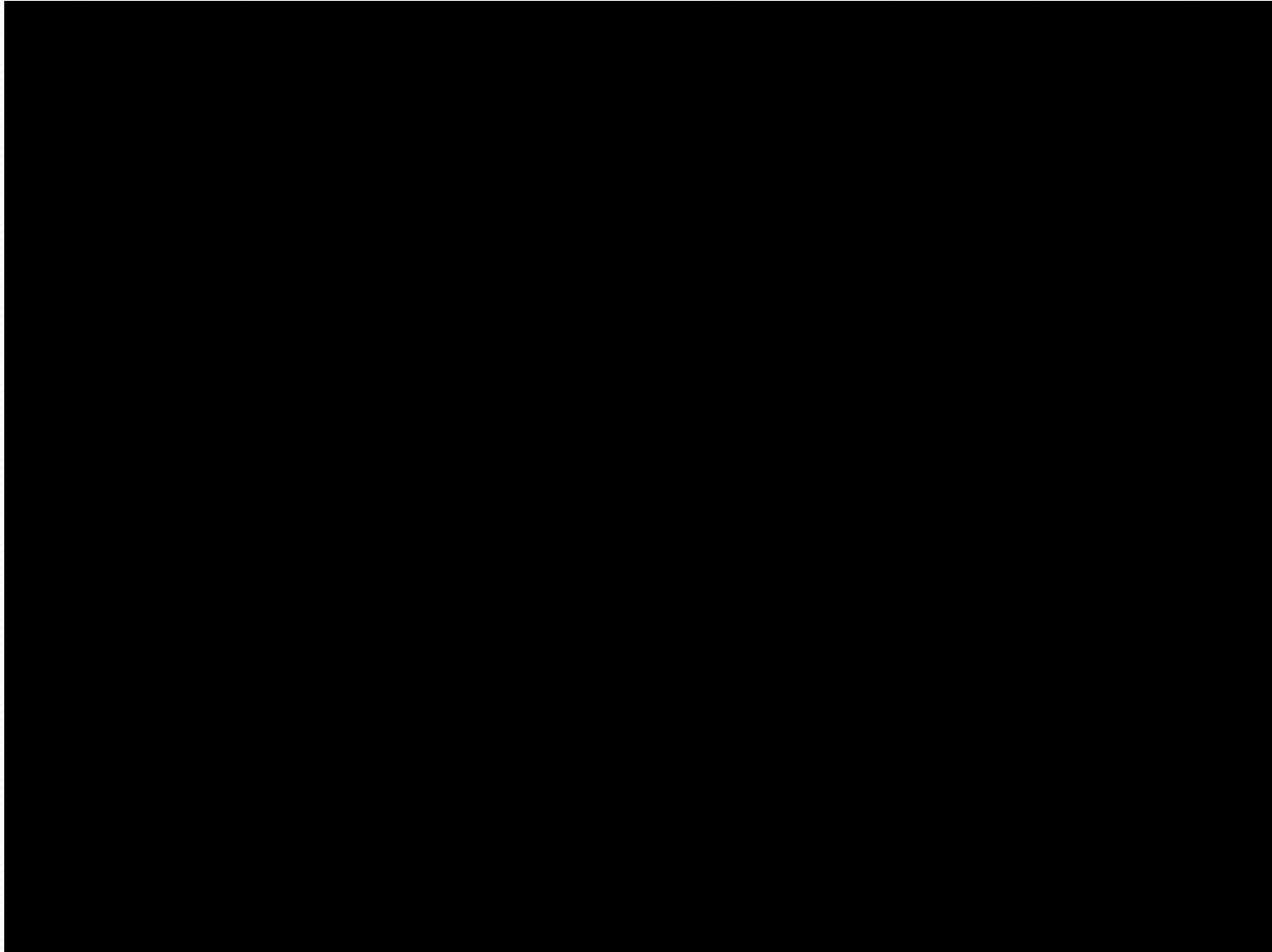
(MULTIPOTENT CELLS)

- They are postembryonic stem cells required for normal cellular turnover and repair.
- The best example is the hematopoietic stem cell but they are found in nearly every major organ.
- They are relatively undifferentiated cells that are able to maintain their own numbers for life through continuous division.
- Their progeny can differentiate into various cell lineages
- They divide slowly and this reduces the rate at which stem cells acquire DNA mutations

CELL ISOLATION AND BONE MARROW STEM CELL SEPARATION



APPLICATION OF CELL THERAPY



VIDEO 3

CASE 1

DIABETIC FOOT ULCER



1 week after therapy



4 weeks after therapy



6 weeks after therapy



6 weeks after therapy



6 weeks after therapy



CASE 2

AT PRESENTATION



48 HRS AFTER CELL THERAPY



2 WEEKS AFTER THERAPY



6 WEEKS AFTER THERAPY



CASE 3

Non-healing ulcer with discharging pus
-Post amputation



WOUND AFTER DEBRIDEMENT



48 HOURS AFTER APPLICATION



SICKLE CELL ULCER

- **Sickle cell disease (SCD) is an inherited blood disorder that causes bone marrow to produce RBCs with defective hemoglobin, HbS**
- **Leg ulcers are most common cutaneous manifestation of SCD. These ulcers are characterized by indolent, intractable course typically healing up to 16 times slower than venous ulcers. A patient who experiences sickle cell ulcers is likely to ulcerate again. Approximately 97% of healed sickle cell ulcers will recur in less than 1 year.**
- **Due to recalcitrant nature of these ulcers patient may experience significant disfigurement, non-healing, graft failure, chronicity, malignant transformation, social isolation & loss of income.**

CASE 1

ON PRESENTATION



AFTER DEBRIDEMENT



1 WEEK AFTER APPLICATION



2 WEEKS AFTER



6 WEEKS AFTER



CASE 2

BILATERAL SICKLE CELL LEG ULCER



AFTER DEBRIDEMENT



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