

# BURNS FOR NURSING STUDENTS

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# ITEMS TO BE DISCUSSED

- **DEFINITION**
- **TYPES**
- **PATHOPHYSIOLOGY**
- **INJURY ZONES**
- **BURN DEPTH**
- **BURN SIZE**
- **CRITERIA FOR ADMISSION**
- **TTT OF MINOR BURNS.**
- **PARTIAL THICKNESS "BURN DRESSING"**
- **SPECIAL AREAS**
- **MANAGEMENT OF MAJOR BURNS**
- **SURGICAL MANAGEMENT OF BURN**

# TERMS YOU'LL NEED TO UNDERSTAND

- ✓ ALLOGRAFT
- ✓ AUTOGRAFT
- ✓ BIOSYNTHETIC GRAFT
- ✓ BURN SHOCK
- ✓ CONSENSUS FORMULA
- ✓ CONTRACTURE
- ✓ DEBRIDEMENT
- ✓ DONOR SITE
- ✓ EMERGENT PHASE OF BURN INJURY
- ✓ ESCHAR

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- ✓ **HETEROGRAFT**
  - ✓ **HOMOGRAFT**
  - ✓ **INTERMEDIATE PHASE OF BURN INJURY**
  - ✓ **JOBST GARMENT**
  - ✓ **LUND AND BROWDER METHOD**
  - ✓ **PALM METHOD**
  - ✓ **PARKLAND FORMULA**
  - ✓ **REHABILITATIVE PHASE OF BURN INJURY**
  - ✓ **RULE OF NINES**
  - ✓ **TOTAL BODY SURFACE AREA (TBSA)**

# **NURSING SKILLS YOU'LL NEED TO MASTER**

- ✓ PERFORMING STERILE DRESSING CHANGE**
- ✓ ADMINISTERING MEDICATIONS**
- ✓ TRANSFUSING BLOOD AND BLOOD PRODUCTS**
- ✓ PERFORMING TRACHEOSTOMY SUCTION AND CARE**
- ✓ MONITORING CENTRAL VENOUS PRESSURE**



- ✓ CARING FOR CENTRAL LINES
- ✓ ASSESSING A BURN INJURY USING THE RULE OF NINES
- ✓ CALCULATION OF IV FLUID REQUIREMENTS
- USING THE PARKLAND FORMULA AND THE
- CONSENSUS FORMULA

# DEFINITION

A BURN IS A TISSUE INJURY FROM THERMAL APPLICATION, OR FROM ABSORPTION OF PHYSICAL INJURY OR CHEMICAL CONTACT.





# TYPES OF BURNS

- **SCALDS:**

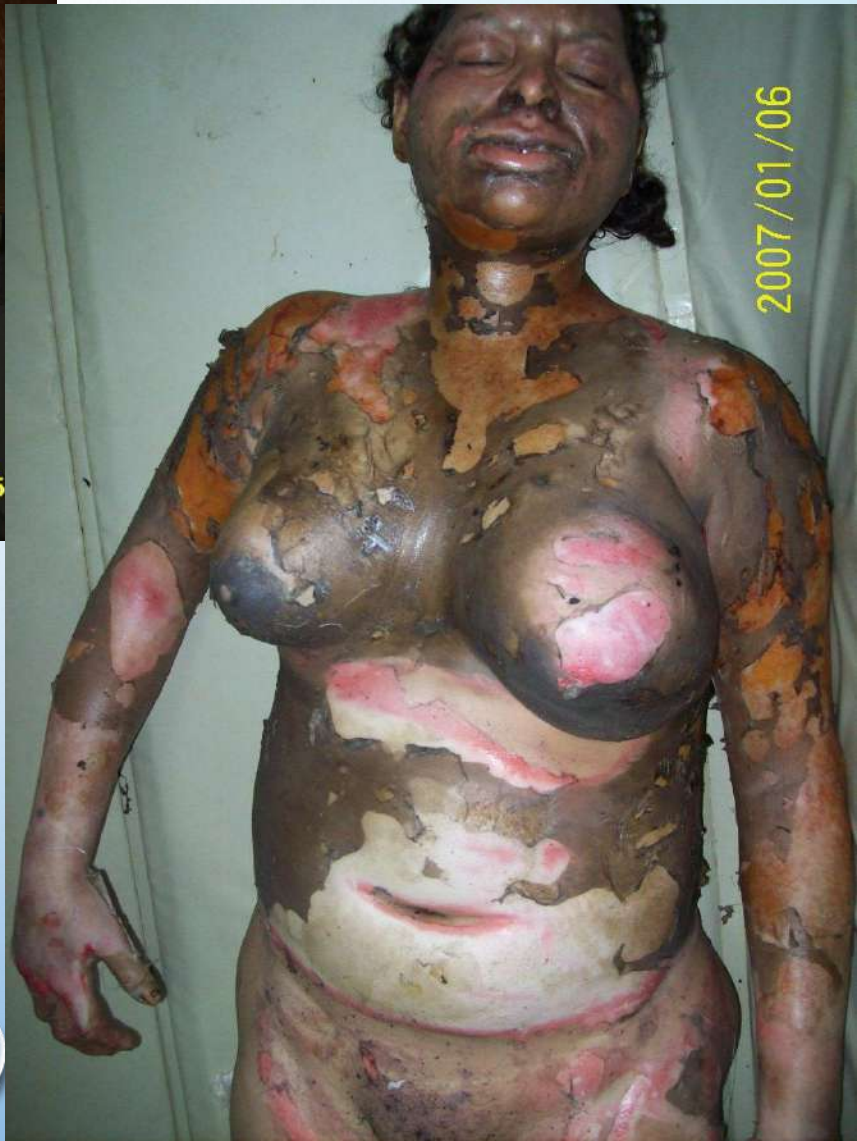
THE DEPTH OF SCALD INJURIES DEPEND ON THE WATER TEMPERATURE, THE SKIN THICKNESS, AND THE DURATION OF CONTACT. WATER AT 60°C CREATES A DEEP DERMAL BURN IN 3 SECONDS BUT WILL CAUSE THE SAME INJURY IN 1 SECOND AT 69°C .



- ***FLAME OR THERMAL BURNS:***

- FLAME BURNS ARE MORE SERIOUS AND RESULT IN MOST BURN UNIT ADMISSIONS.
- THERE IS SUDDEN EXPOSURE TO INTENSE HEAT OF SHORT DURATION SO THAT THE CLOTHING MAY AFFORD A MEASURE OF PROTECTION AND THE FACE AND HANDS MAY BE THE ONLY PARTS INJURED.





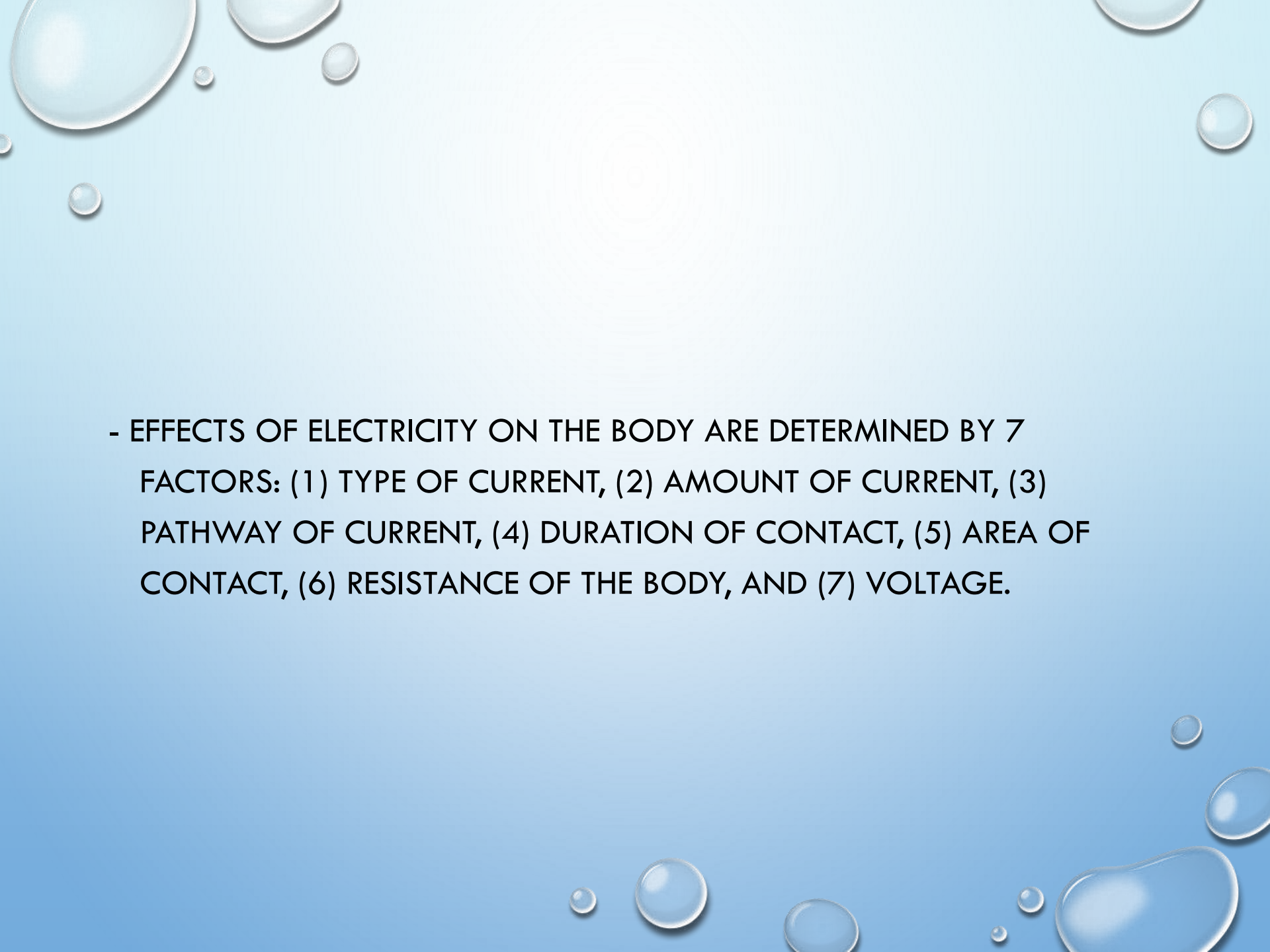


- ***ELECTRICAL BURN INJURIES:***

- ELECTRICAL BURNS ARE CAUSED BY THE CONVERSION OF ELECTRICAL ENERGY INTO HEAT, AND SEVERITY OF BURNING IS PROPORTIONAL TO THE ELECTRICAL RESISTANCE OF TISSUE THROUGH WHICH THE CURRENT IS TRANSMITTED.







- EFFECTS OF ELECTRICITY ON THE BODY ARE DETERMINED BY 7 FACTORS: (1) TYPE OF CURRENT, (2) AMOUNT OF CURRENT, (3) PATHWAY OF CURRENT, (4) DURATION OF CONTACT, (5) AREA OF CONTACT, (6) RESISTANCE OF THE BODY, AND (7) VOLTAGE.



- **CHEMICAL BURNS:**

- CHEMICAL BURNS ARE INFLAMMATORY OR CORROSIVE REACTIONS OF THE SKIN CAUSED BY SOME CHEMICAL PROPERTY OF THE AGENT.
- ACIDS CAUSE LOCAL COAGULATION OF PROTEINS AND NECROSIS.
- ALKALIS CAUSE LIQUEFACTIVE NECROSIS.





2008/09/

- ***FRICTION BURNS:***

- THE TISSUE DAMAGE IN FRICTION BURNS IS DUE TO A COMBINATION OF HEAT AND ABRASION.
- THERE IS GENERALLY A SUPERFICIAL OPEN WOUND THAT MAY PROGRESS TO FULL THICKNESS SKIN LOSS.





- ***COLD INJURY:***

- THE INJURIES CAUSE ACUTE CELLULAR DAMAGE WITH THE POSSIBILITY OF EITHER A PARTIAL THICKNESS OR FULL THICKNESS BURN.
- SEVERE COOLING CAN FREEZE TISSUES AND ICE FORMATION IS PARTICULARLY LIKELY TO CAUSE CELLULAR DISRUPTION.





# PATHOPHYSIOLOGY

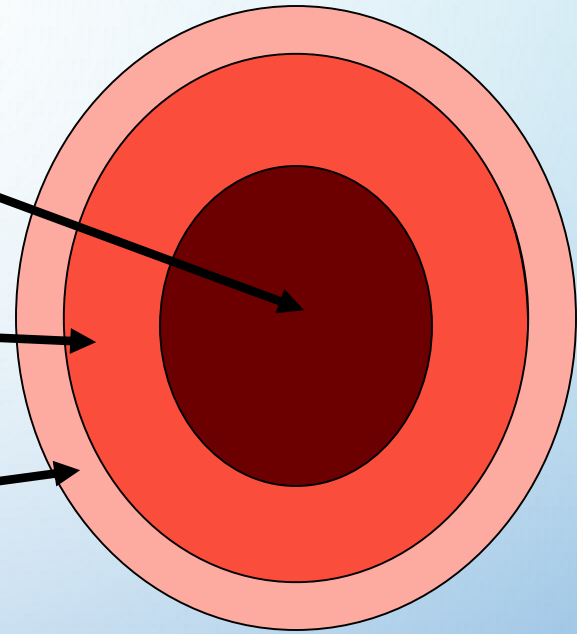
- IN LARGE BURNS, **VASOACTIVE AMINES** (HISTAMINE AND SEROTONIN) FROM THE INFLAMMATORY RESPONSE ARE RELEASED INTO THE GENERAL CIRCULATION, CAUSING A GENERALIZED INCREASE IN **CAPILLARY PERMEABILITY**.
- INCREASED CAPILLARY PERMEABILITY IN THE BURNT AREA LEADS TO THE LOSS OF ENORMOUS AMOUNTS OF FLUIDS AND PROTEINS IN THE DAMAGE AREA. THIS IS MAXIMUM IN **THE FIRST 8 HR** AND CONTINUES FOR 48 HR.

# INJURY ZONES

Zone of Coagulation

Zone of Stasis

Zone of Hyperemia





Vascular permeability  
and edema

Altered hemodynamics

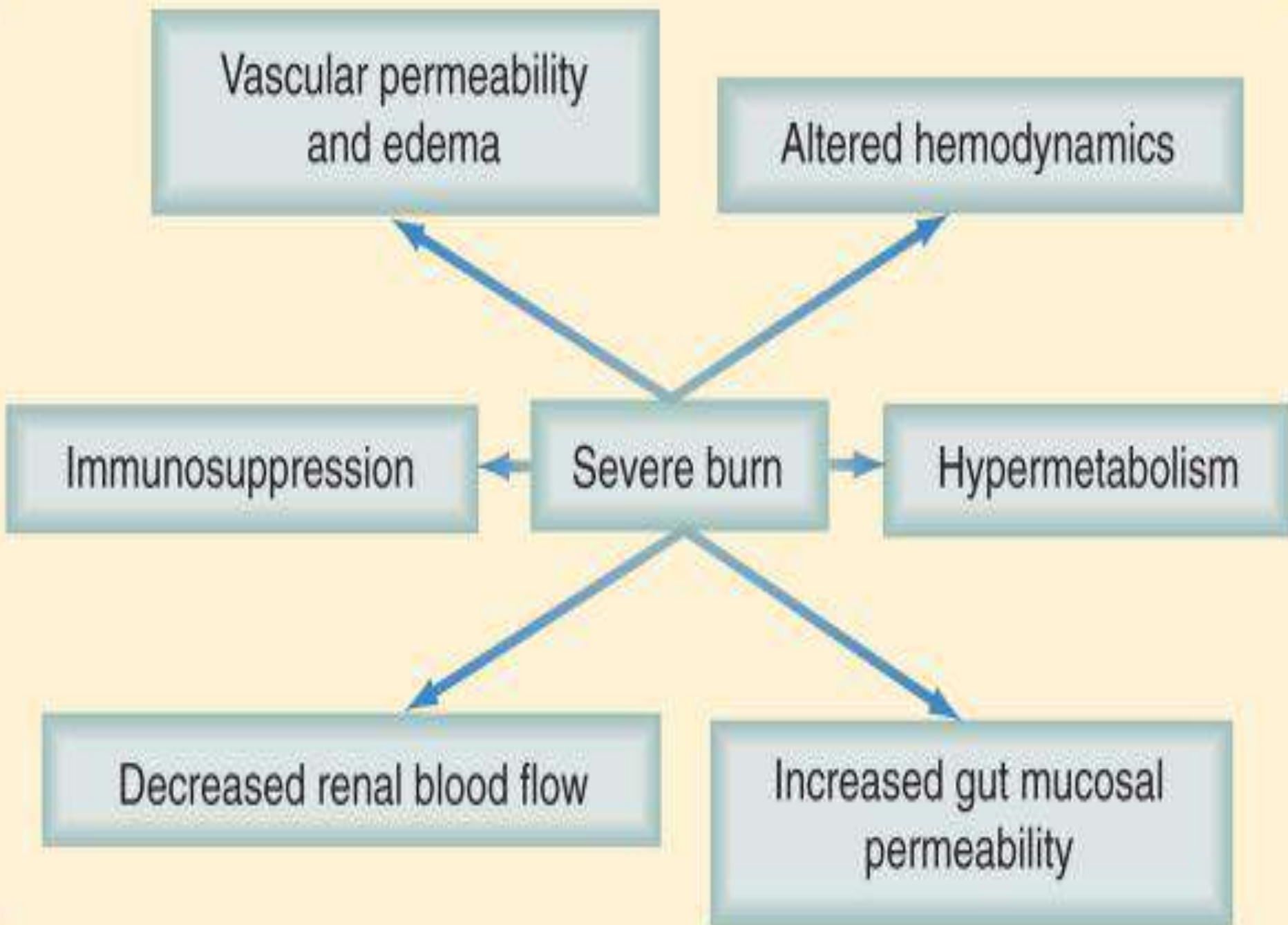
Immunosuppression

Severe burn

Hypermetabolism

Decreased renal blood flow

Increased gut mucosal  
permeability

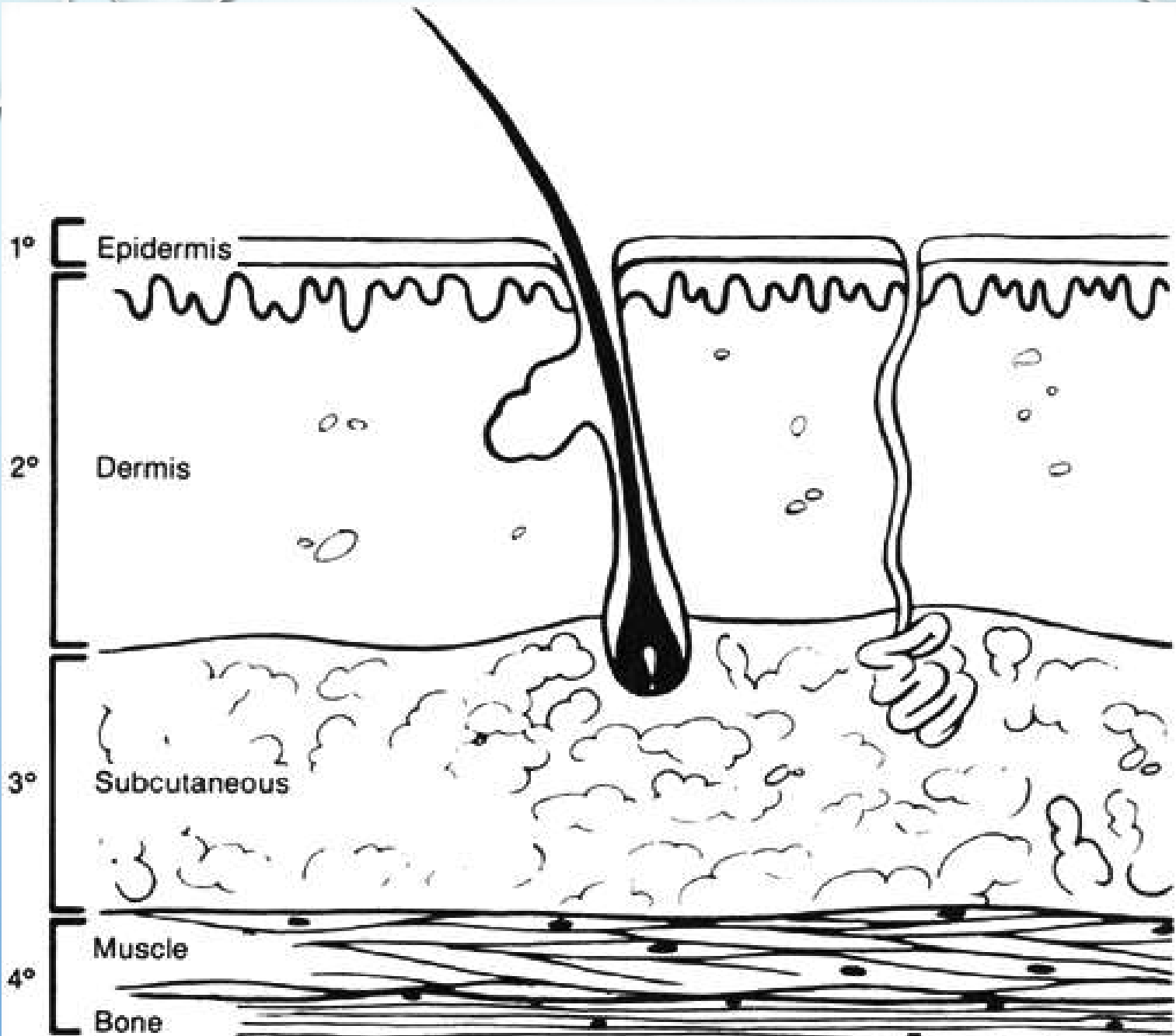


# MANAGEMENT



# CLASSIFICATION ACCORDING TO DEPTH:

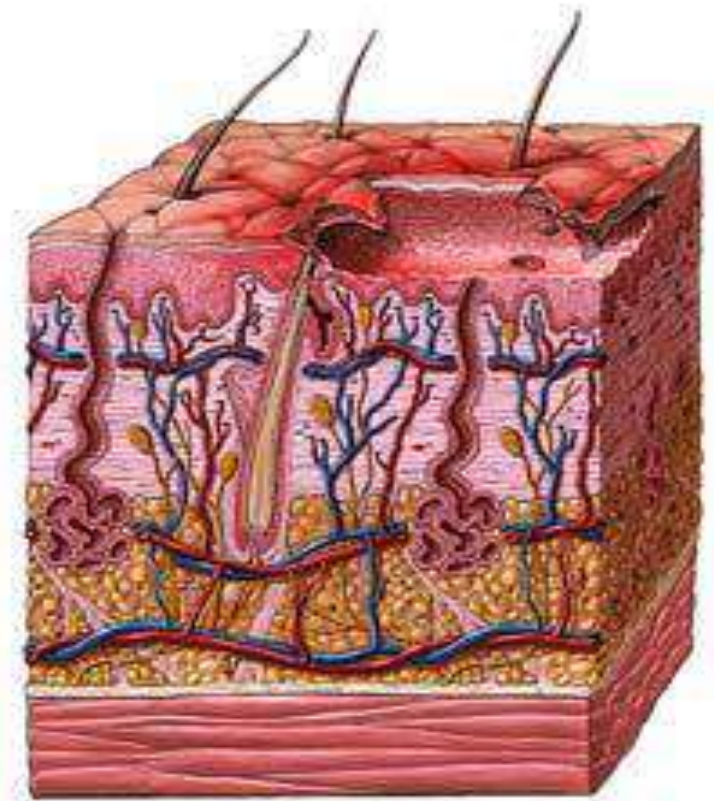
- **FIRST, SECOND AND THIRD** DEGREE.
- ALSO IT CAN BE CLASSIFIED AS EITHER **EPIDERMAL , SUPERFICIAL DERMAL , DEEP DERMAL** AND **FULL-THICKNESS**, DEPENDING ON THE DEPTH OF SKIN AND SUBCUTANEOUS DESTRUCTION.



*Caldwell*



1<sup>ST</sup>  
DEGREE



1st degree burn



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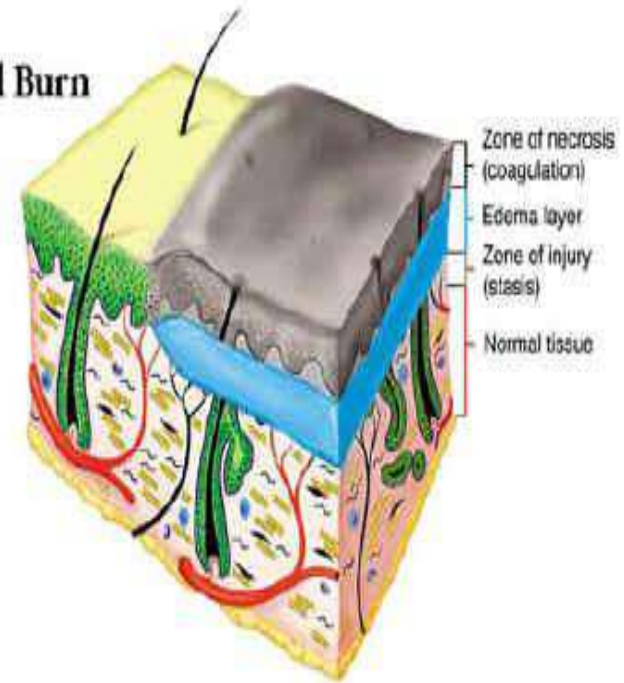


# SUPERFICIAL 2<sup>ND</sup> DEGREE

## Superficial Dermal Burn

### Characteristics

1. Necrosis confined to upper third of dermis
2. Zone of necrosis lifted off viable wound by edema
3. Small zone of injury

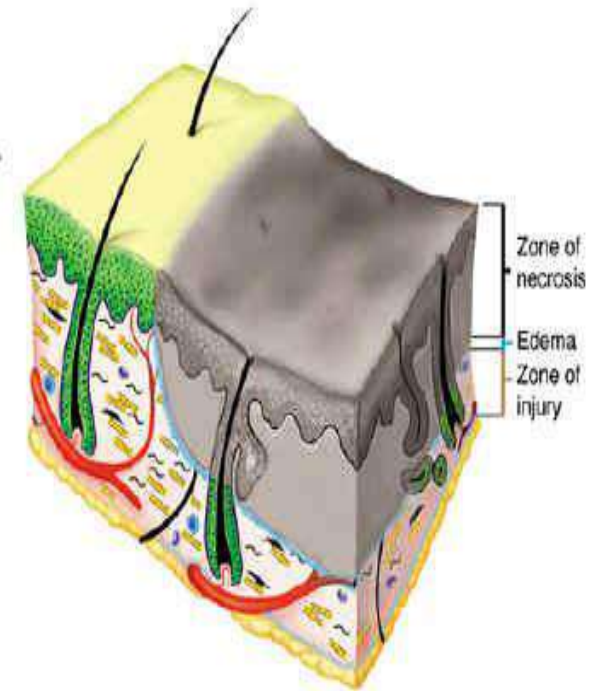


# DEEP 2<sup>ND</sup> DEGREE

## Deep Dermal Burn

### Characteristics

1. Necrosis involving majority of skin layers
2. Zone of necrosis adherent to zone of injury
3. Smaller edema layer

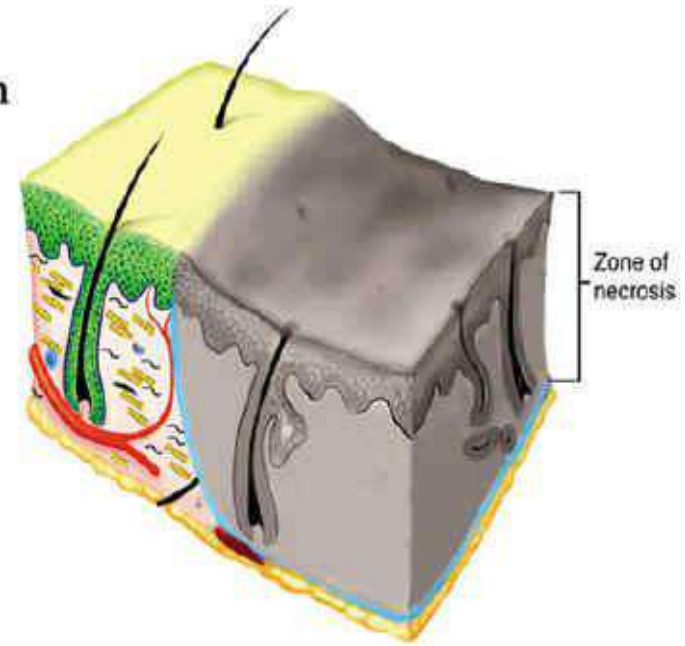




# FULL THICKNESS BURN

## Full Thickness Burn

**Characteristic**  
No remaining viable dermis



# ESTIMATION OF BURN SIZE

- **DO NOT INCLUDE** AREAS OF ERYTHEMA IN CALCULATIONS “1<sup>ST</sup> DEGREE”



## ESTIMATION OF BURN SIZE

### (1) Rule of nines:

- 9 *Head*
- 9 *Each upper limb*
- 18 *Front trunk*
- 18 *Back trunk*
- 18 *Each lower limb*
- 1 *perineum*

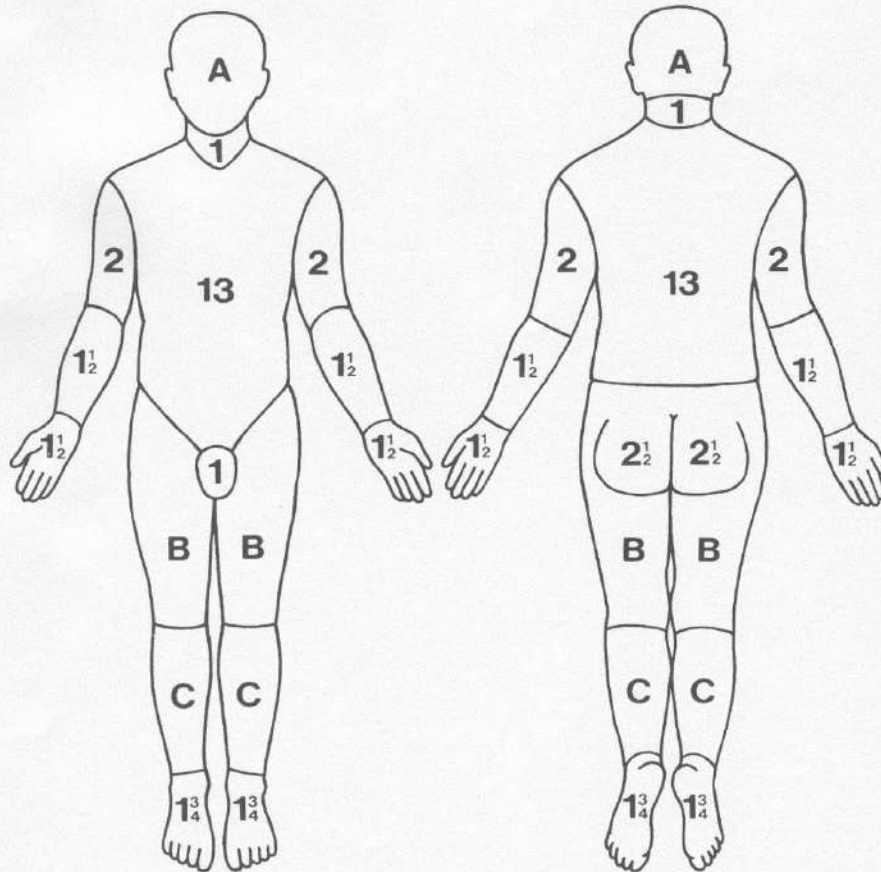
### (2) Rule of fives ( child ):

- 20 *Head*
- 10 *Each upper limb*
- 20 *Front trunk*
- 20 *Back trunk*
- 10 *Each lower limb*

% burns

LUND AND BROWDER CHARTS

IGNORE  
SIMPLE ERYTHEMA



 Superficial  
 Deep

REGION	%
HEAD	
NECK	
ANT. TRUNK	
POST. TRUNK	
RIGHT ARM	
LEFT ARM	
BUTTOCKS	
GENITALIA	
RIGHT LEG	
LEFT LEG	
TOTAL BURN	

RELATIVE PERCENTAGE OF BODY SURFACE AREA  
AFFECTED BY GROWTH

AREA	AGE 0	1	5	10	15	ADULT
A = 1/2 OF HEAD	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2	3 1/2
B = 1/2 OF ONE THIGH	2 3/4	3 1/4	4	4 1/2	4 1/2	4 3/4
C = 1/2 OF ONE LEG	2 1/2	2 1/2	2 3/4	3	3 1/4	3 1/2

# (3) Lund and Browder chart

- (4) USE **PATIENTS HAND SIZE** AS A GUIDE WITH FINGERS EXTENDED AND ADDUCTED = APPROX. 1% OF PATIENTS BODY AREA.

# CRITERIA FOR ADMISSION

1. **2<sup>ND</sup> DEGREE BURN >10% IN A CHILD**
2. **2<sup>ND</sup> DEGREE BURN >15% IN AN ADULT.**
3. **BURNS INVOLVING THE FACE, EYES, EARS, HANDS, FEET, GENITALIA, OR PERINEUM OR THOSE THAT INVOLVE SKIN OVERLYING MAJOR JOINTS.**
4. **FULL-THICKNESS BURNS.**
5. **ELECTRICAL BURNS.**
6. **SIGNIFICANT CHEMICAL BURNS.**
7. **INHALATION INJURY.**
8. **SIGNIFICANT CO-MORBIDITY (E.G.: IDDM, PREGNANCY, ALCOHOLIC, IMMUNOSUPPRESSED) OR POOR SOCIAL CIRCUMSTANCES**



The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The text "MINOR BURNS." is centered in the middle of the image.

**MINOR BURNS.**

# MINOR BURNS

## AIMS OF TREATMENT

- PREVENT INFECTION.
- ABSORB EXUDATE.
- RELIEVE PAIN.
- ACHIEVE BEST POSSIBLE COSMETIC/FUNCTIONAL RESULT.

# MINOR BURNS FIRST AID MEASURES

- COLD WATER LAVAGE (TEMP ~15°C) FOR ~20 MIN.
- DON'T APPLY ICE.
- APPROPRIATE ANALGESIA.



# TREATMENT SIMPLE ERYTHEMA

- LEAVE OPEN.
- ADVISE APPLY SIMPLE EMOLLIENT IF BECOMES DRY/FLAKY.
- **RETURN IF BLISTERING.**



# PARTIAL THICKNESS "BURN DRESSING"

- IRRIGATE
- BLISTERS MAY BE LEFT, DEROOFED OR PUNCTURED ?????
- ABSORBENT LAYER
- ANTIBIOTIC OINTMENT
- BANDAGE
- ANALGESIA
- FOLLOW UP

# SPECIAL AREAS

## (1) HANDS

- GOOD FUNCTIONAL RESULT IS KEY.
- POTENTIAL PROBLEMS WITH CONTRACTURES AND JOINT STIFFNESS.
- ELEVATE.
- KEEP DRESSINGS TO A MINIMUM AND ENCOURAGE EARLY MOBILISATION EXERCISES.



# HANDS AND FEET



Leave tips of fingers exposed.  
Keep limb elevated.







- ALLOW USE OF THE HANDS IN DRESSINGS BY DAY.
- SPLINT IN FUNCTIONAL POSITION BY NIGHT.



✘ FINGERS MIGHT DEVELOP  
CONTRACTURES IF ACTIVE MEASURES ARE  
NOT TAKEN TO PREVENT THEM.





ACIAL B

## (2) FACE

- EARLY REFERRAL FOR ANY DEEP PARTIAL OR FULL THICKNESS BURNS.
- IRRIGATE.
- LEAVE EXPOSED.
- ENT & OPHTHALMOLOGY ASSESSMENT.
- MED. TTT





## (3) PERINEUM & GENITALIA

- DIFFICULT AREA TO DRESS.
- HIGH RISK OF INFECTION.
- PROBLEMS WITH URINATION/DEFECATION IF EXTENSIVE.
- SHOWER DAILY, RINSE OFF OLD CREAM, APPLY NEW CREAM.
- INSERT FOLEY CATHETER IF UNABLE TO URINATE DUE TO SWELLING.





The background features a light blue gradient with several realistic water droplets of various sizes scattered across the surface. A faint, semi-transparent globe is centered in the upper half of the image, behind the text.

# **MANAGEMENT OF MAJOR BURNS**

- 
- The background features a light blue gradient that transitions from a pale, almost white hue at the top to a deeper blue at the bottom. Scattered throughout are several realistic water droplets of various sizes, some with soft shadows and highlights, giving them a three-dimensional appearance. The droplets are most concentrated in the top-left and bottom-right corners.
- APPROPRIATE EARLY MANAGEMENT IMPROVES SURVIVAL.
  - MAJOR BURNS ARE A MULTISYSTEM INJURY

# DON'T FORGET

- **A:** AIRWAY
- **B:** BREATHING
- **C:** CIRCULATION
- **D:** DRUGS
- **E:** EXPOSURE & EXAMINATION
- **F:** FLUID THERAPY & FEEDING "NUTRITION"

# DRUGS

1. ANTIBIOTICS
2. ANALGESICS, ANTIPYRETICS
3. I.V STEROIDS
4. PROTON PUMP INHIBITORS,ANTACIDS
5. BETA BLOCKERS
6. ANTIFUNGALS



# EXPOSURE

TO DETERMINE:

1. DEPTH
2. EXTENT
3. ASSOCIATED INJURY

# **F**FLUID RESUSCITATION

- **GOAL:** MAINTAIN PERFUSION TO VITAL ORGANS
- **BASED ON** THE TBSA, BODY WEIGHT AND AGE.
- **FLUID OVERLOAD** SHOULD BE AVOIDED

- **2 LARGE BORE IV LINES** PREFERABLY IN UN BURNT SKIN.

- **URINARY CATHETER:** HOURLY URINE VOLUMES.

AIM FOR URINE OUTPUT OF 30MLS PER HOUR IN ADULT  
(**1ML/KG/HR IN CHILD**)

- **CVP MONITORING**

# ASSESSING ADEQUACY OF RESUSCITATION

- **PERIPHERAL BLOOD PRESSURE:**
- **HEART RATE:**
- **URINE OUTPUT:**
- **CVP:**



# BURN FORMULAS

## PARKLAND FORMULA

- **4 CC R/L X % BURN X BODY WT. IN KG.**
- **1/2 OF CALCULATED FLUID IS ADMINISTERED IN THE FIRST 8 HOURS.**
- **THE REMAINING 1/2 OF THE DOSE IS GIVEN OVER THE REMAINING 16 HOURS.**
- **MAINTAIN URINE OUTPUT AT 0.5 CC/KG/HR.**

# OTHER FORMULAS

- BROOK'S FORMULA
- MODIFIED BROOK'S FORMULA
- EVANS FORMULA

# FEEDING “NUTRITION”

- NEED MORE CALORIES THAN NORMAL
- PROTEIN INTAKE ABOUT 1.5-2 G/DAY
- EQUATION FOR CALORIES ??????

The background is a light blue gradient. In the center, there is a faint, circular ripple effect, suggesting a drop of water. Scattered around the edges are several realistic water droplets of various sizes, some with highlights and shadows, giving them a three-dimensional appearance.

# **SURGICAL MANAGEMENT OF BURN**

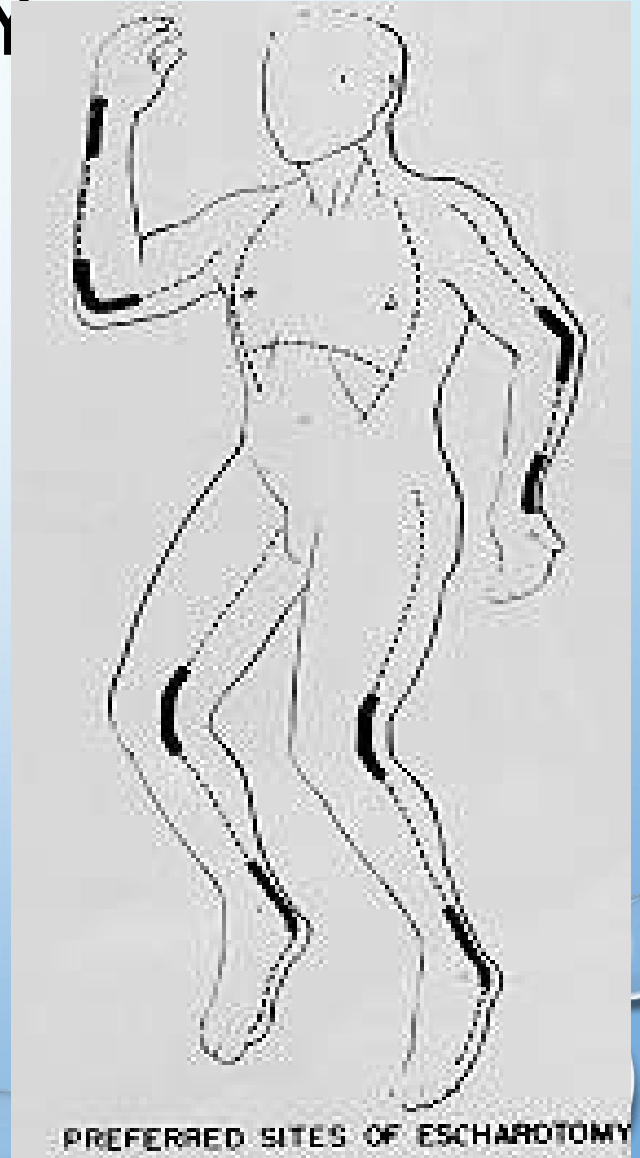
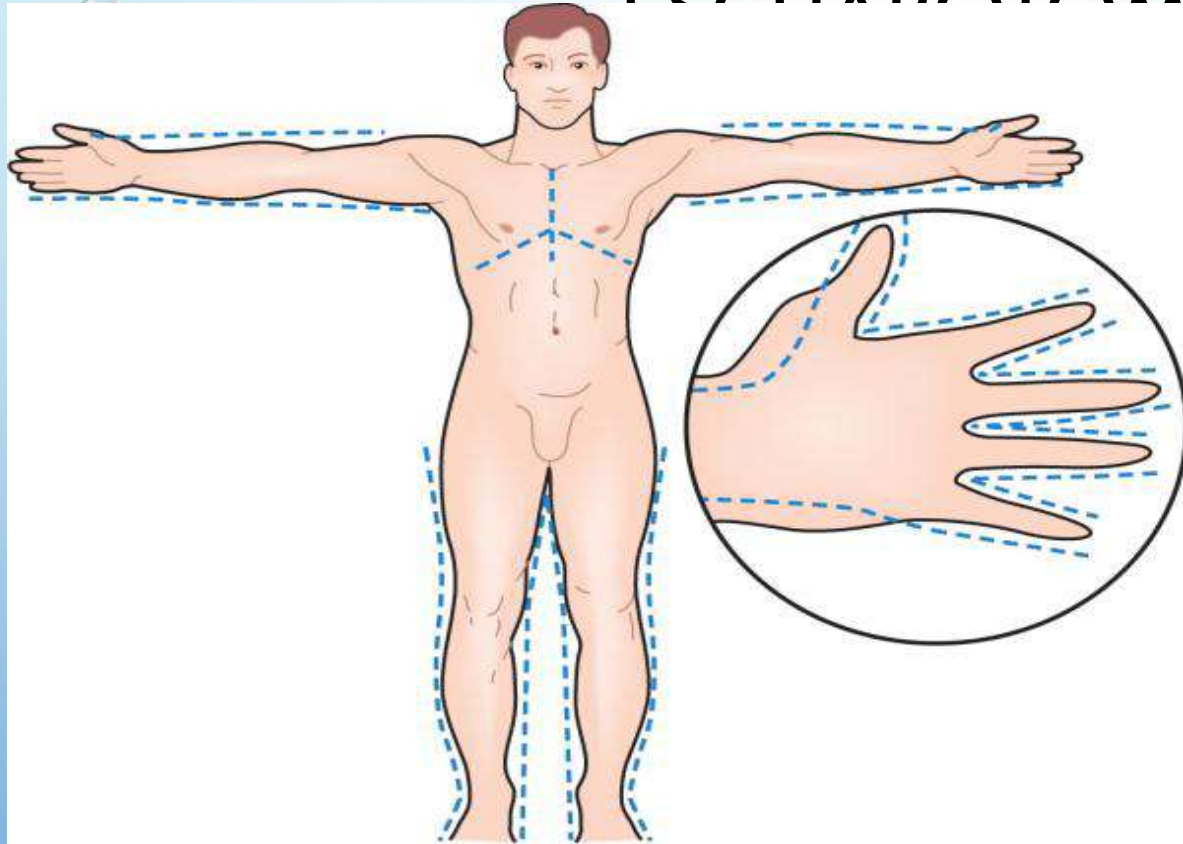


1. BURN REQUIRING **ESCHAROTOMY** AS CIRCUMFERENTIAL BURN.
2. EARLY **EXCISION** AND **GRAFT**.
3. **SPLIT THICKNESS GRAFT** FOR THE RESIDUAL RAW AREAS.

# CIRCUMFERENTIAL BURN

- LIMB IS BURNED ALL THE WAY AROUND.
- PRESSURE INSIDE LIMB GRADUALLY INCREASES.
- EVENTUALLY, PRESSURE INSIDE LIMB EXCEEDS VENOUS THEN ARTERIAL PRESSURE.
- ISCHEMIA THEN RESULTS.
- THIS REQUIRES ESCHAROTOMY TO RELIEVE THE PRESSURE.

# ESCHAROTOMY



# EARLY EXCISION AND GRAFTING

- INDICATED IN:

1. 3<sup>RD</sup> DEGREE BURN
2. APPROPRIATE GENERAL CONDITION

FOR 1% TBSA ,250 CC FRESH BLOOD IS NEEDED





**STG for hand burn**



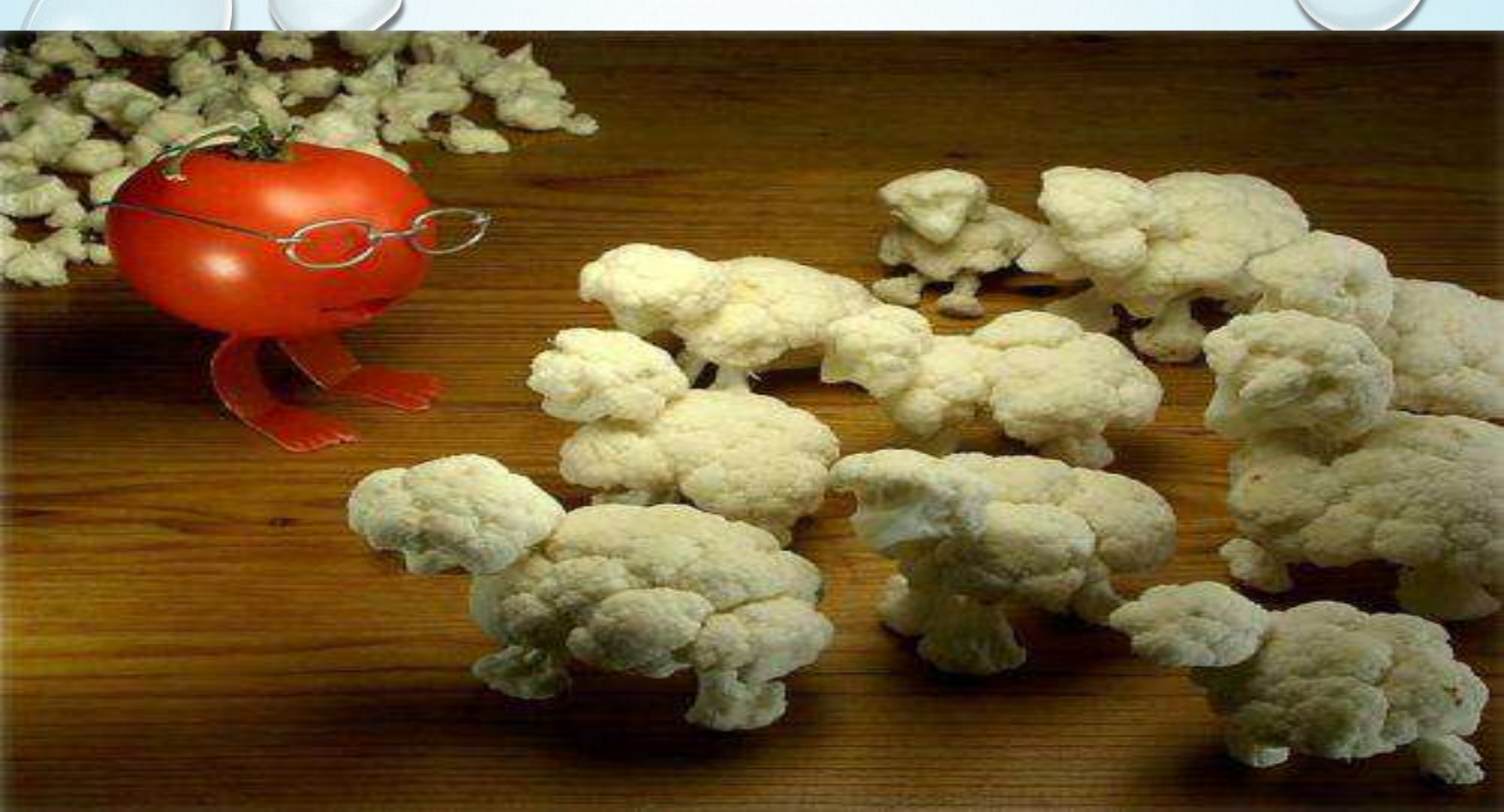


2009/03/19





**QUESTIONS !!!!!**



**Thanks for your attention**