

POSTMORTEM CHANGES AND TIME SINCE DEATH- 1



A good laugh and long sleep
are the two best cures
for anything.

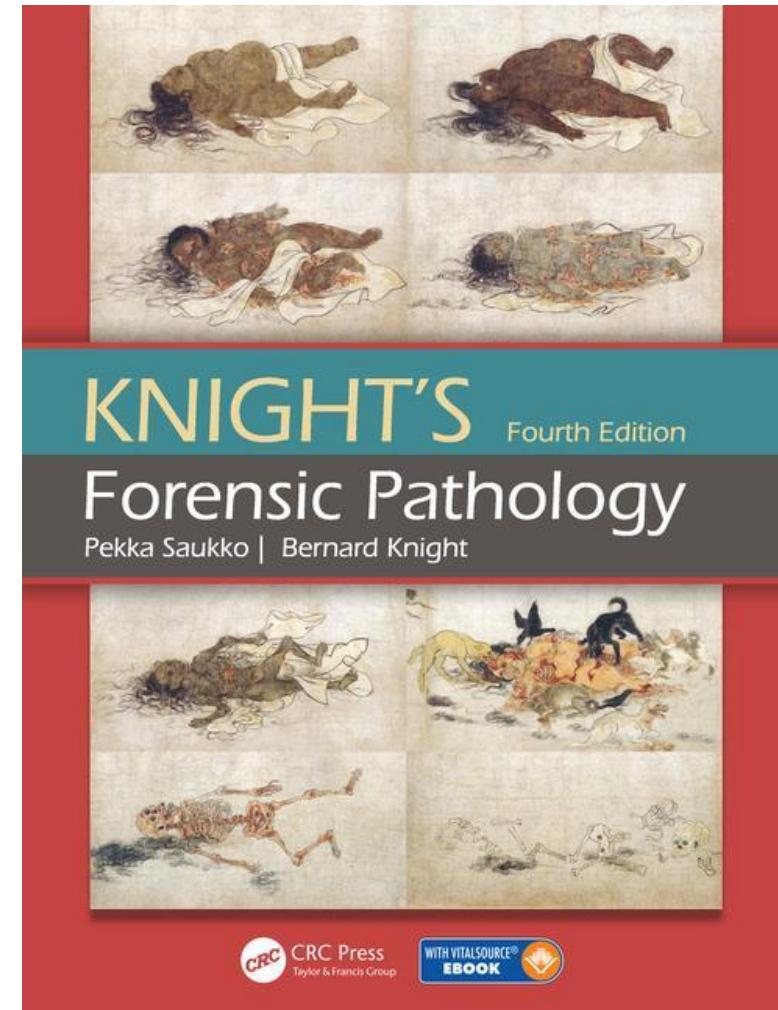
HRP
Hans Riegel

Simpson's Forensic Medicine

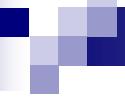
13th Edition



Jason Payne-James
Richard Jones
Steven Karch
John Manlove



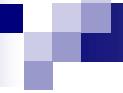




OBJECTIVES

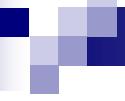
At the end of this lecture the student should be able to

- Identify the changes occurring in various time intervals
- List the factors affecting post mortem changes



OBJECTIVES

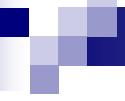
- Describe the principle of cooling of the body
- State the limitations specific to cooling of the body



INTRODUCTION

Post mortem changes can be classified into 4 main groups

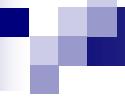
- Immediate
- Early
- Late
- Special



IMMEDIATE CHANGES

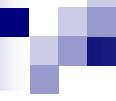
1. Cessation of functions of major systems

- Cardiovascular
- Respiratory
- Gastro intestinal
- Genito urinary



IMMEDIATE CHANGES

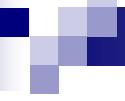
2. Changes in the muscular skeletal system
(Primary flaccidity)



IMMEDIATE CHANGES

3. Changes in the central nervous system

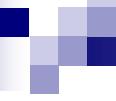
- Fixed dilated pupils
- Lack of sensation and muscle power



IMMEDIATE CHANGES

4. Changes of the skin

- Pallor
- Cessation of hair growth
- Loss of elasticity



EARLY CHANGES

- ❖ Cooling of the body
- ❖ Rigor mortis
- ❖ Hypostasis
- ❖ Skin changes
- ❖ Eye changes



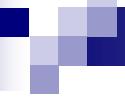
Hypostasis











LATE CHANGES

- Decomposition and skeletalisation
- Maggot infestation
- Predator attacks

Postmortem blistering









Degloving of the hand







Partial skeletonisation





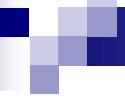
Predator attack





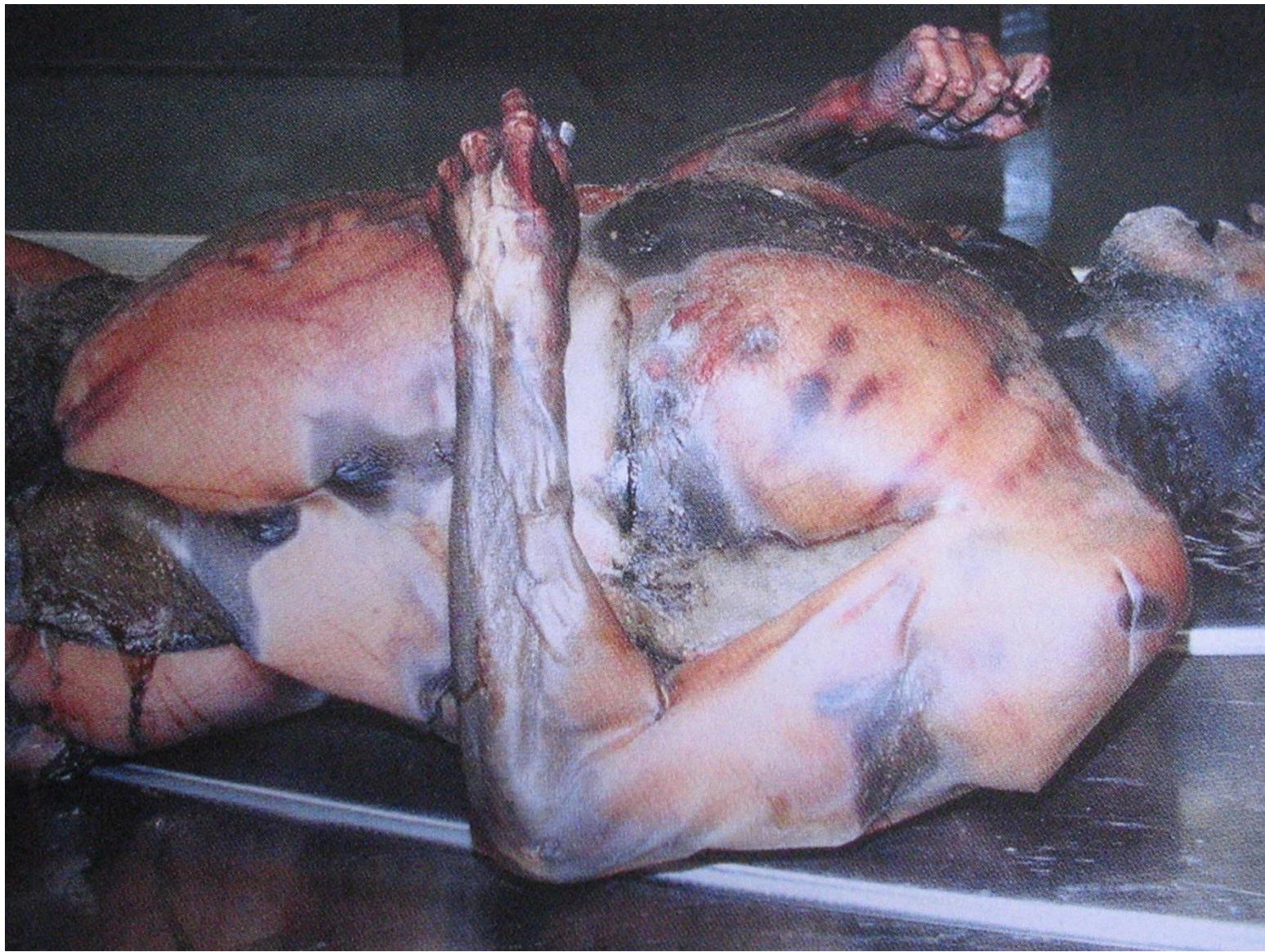




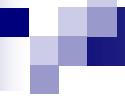


SPECIAL CHANGES

- Adipocere formation
- Mummification





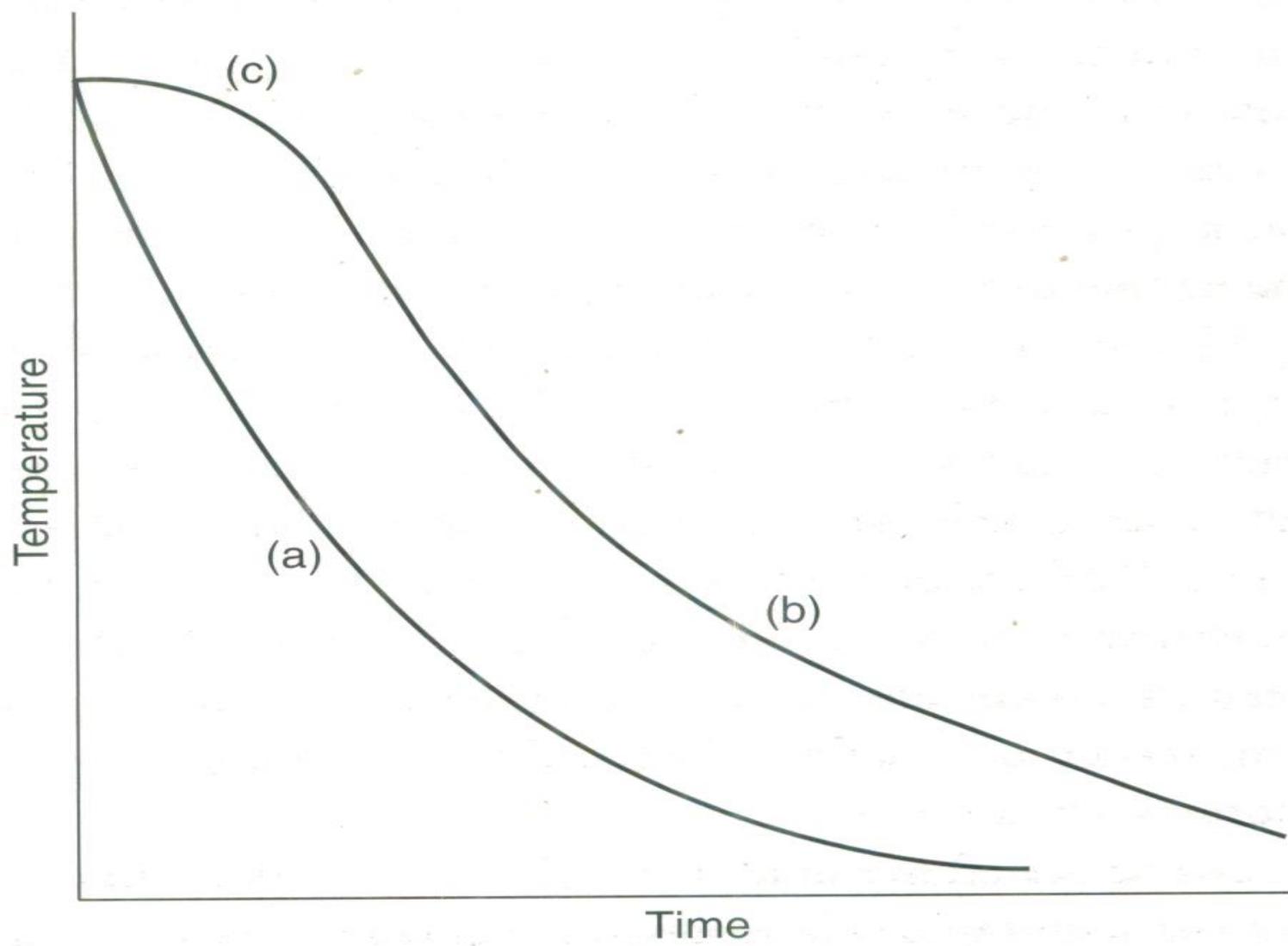


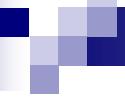
COOLING OF THE BODY

- Most accurate of the inaccurate methods
- Useful in the first 12-18 hours
- Body surface cools immediately but the deep organs including rectum cannot cool until a heat gradient is set up.

COOLING OF THE BODY

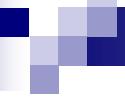
- Appear as a simple exponential curve
- The central part of the curve is a straight line between the two plateaus top and the bottom.





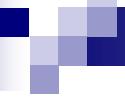
COOLING OF THE BODY

- Once the gradient is established, cools according to Newton's law of cooling
- The rate of cooling is proportional to the difference in temperature between the body and the surrounding



COOLING OF THE BODY

- It will help the back calculation to the time of death assuming the body temperature at the time of death as 37^0C .



TECHNIQUE

- As soon as you arrive, take the environmental temperature and the rectal temperature
- A chemical thermometer should be used

TECHNIQUE ctd.

- Readings should be recorded every half an hour
- The rate of cooling is calculated by plotting the recordings in a graph

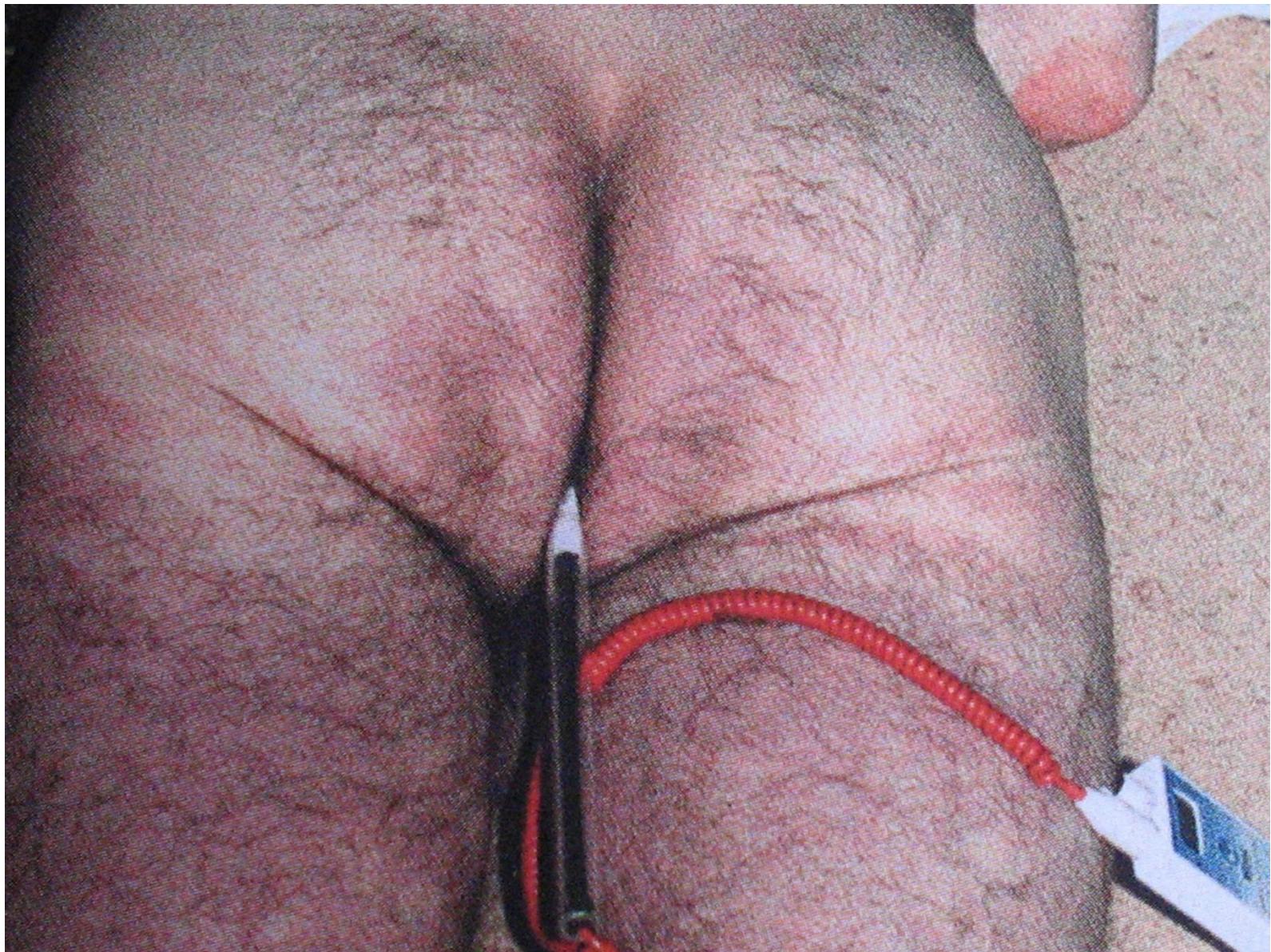
TECHNIQUE ctd.

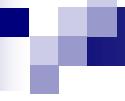
$99F^0$ – Rectal temp

Time since death =

Rate of cooling

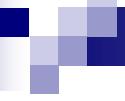
(In Colombo rate of cooling is 0.7- 0.8 F⁰/ hour)





FACTORS AFFECTING THE RATE OF COOLING

- Posture of the body
- Clothing on the body
- Body temperature at the time of death
- Obesity



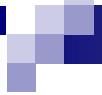
FACTORS AFFECTING THE RATE OF COOLING

- Surface area and the weight
- Environmental temperature
- Windy/rainy weather
- Presence of direct sunlight
- Environmental humidity



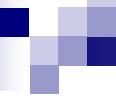
LIMITATIONS

- Rectal temperature at the time of death may not be 99 F⁰. It may change with fever, exercise, hypothermia etc prior to death



LIMITATIONS

- Rate of cooling may change due to various environmental conditions like wind, rain etc.
- In extreme hot conditions the body may not cool at all



LIMITATIONS

- Can be done only in the early postmortem period (0-18 hours)
- In cases of suspected sexual abuse relevant samples must be taken before inserting the thermometer or the temperature at deep nasal cavity or auditory meatus can be used.