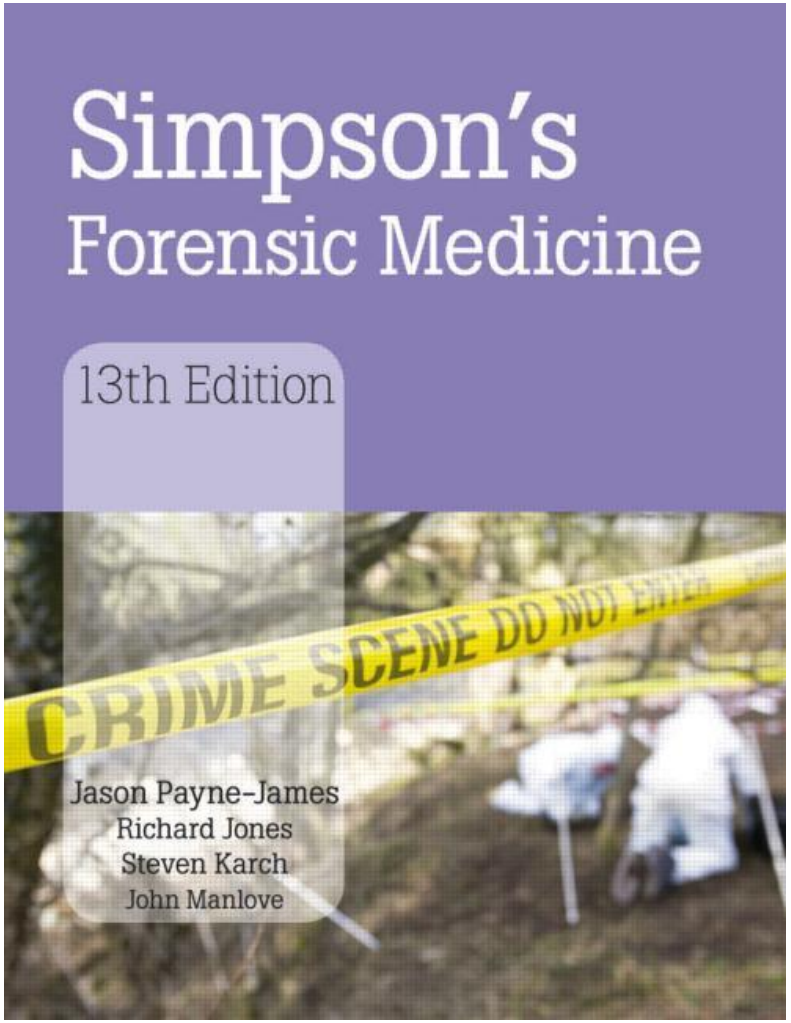
POSTMORTEM CHANGES AND TIME SINCE DEATH- 1


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


Simpson's
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CRIME SCENE DO NOT
Jason Payne-James
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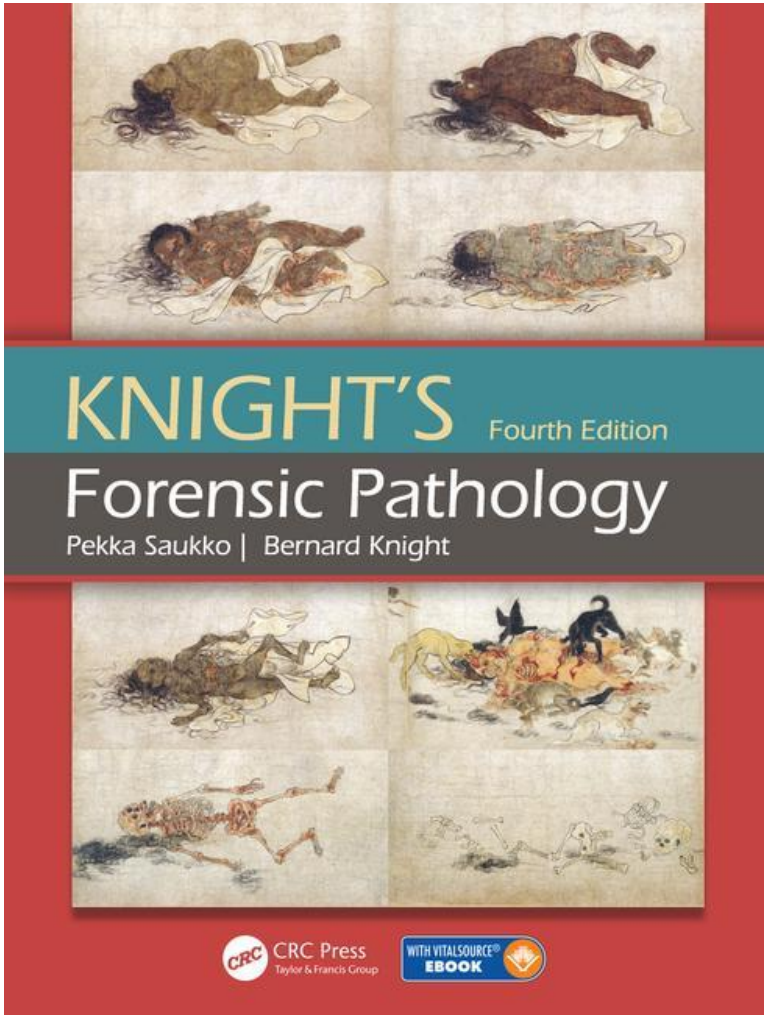
KNIGHT'S
Fourth Edition
Forensic Pathology
Pekka Saukko | Bernard Knight
CRC Press
Taylor & Francis Group
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EBOOK

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

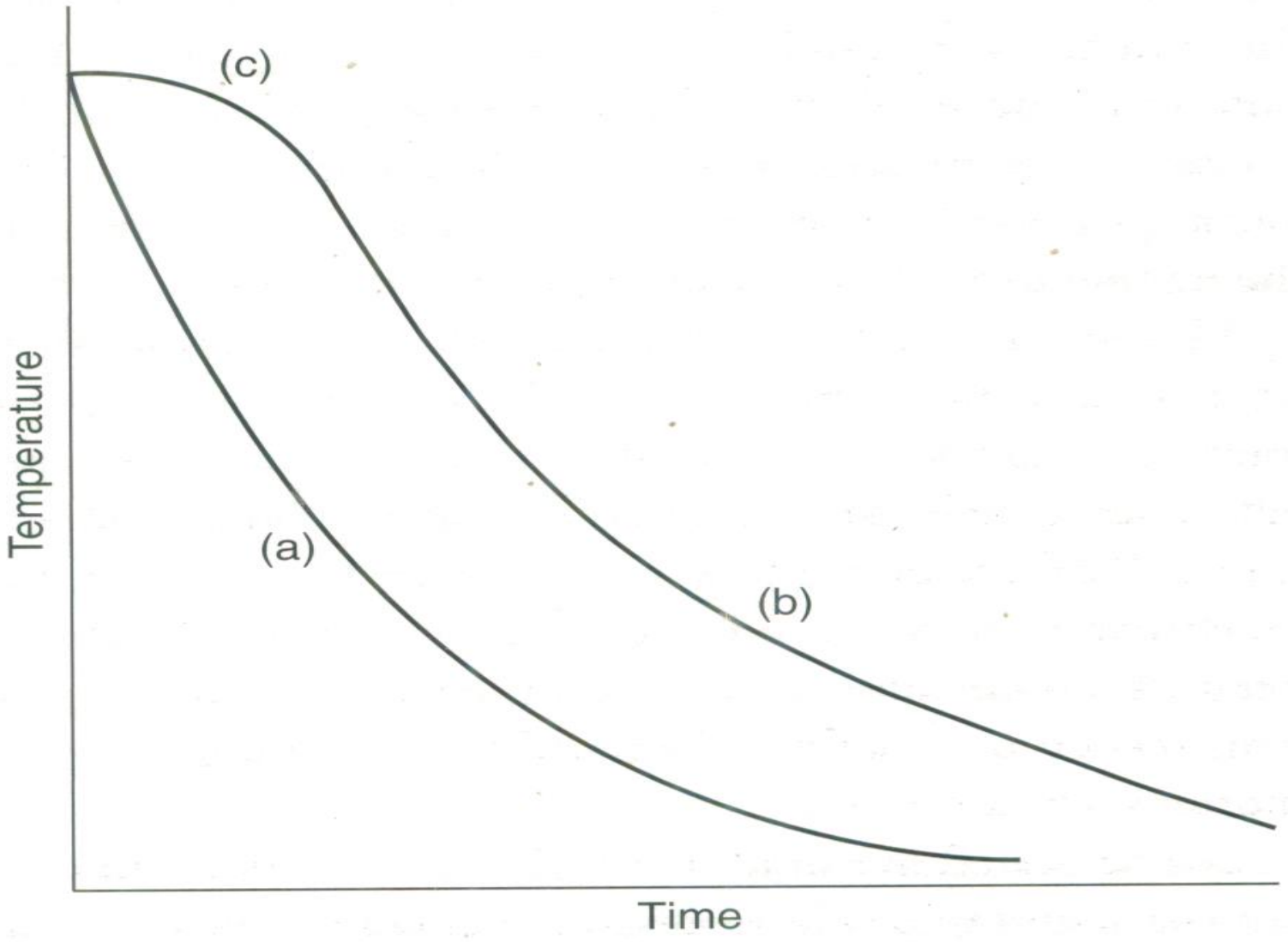
- Adipocere formation
- Mummification

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.


(c)
(a)
(b)
Temperature
Time

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

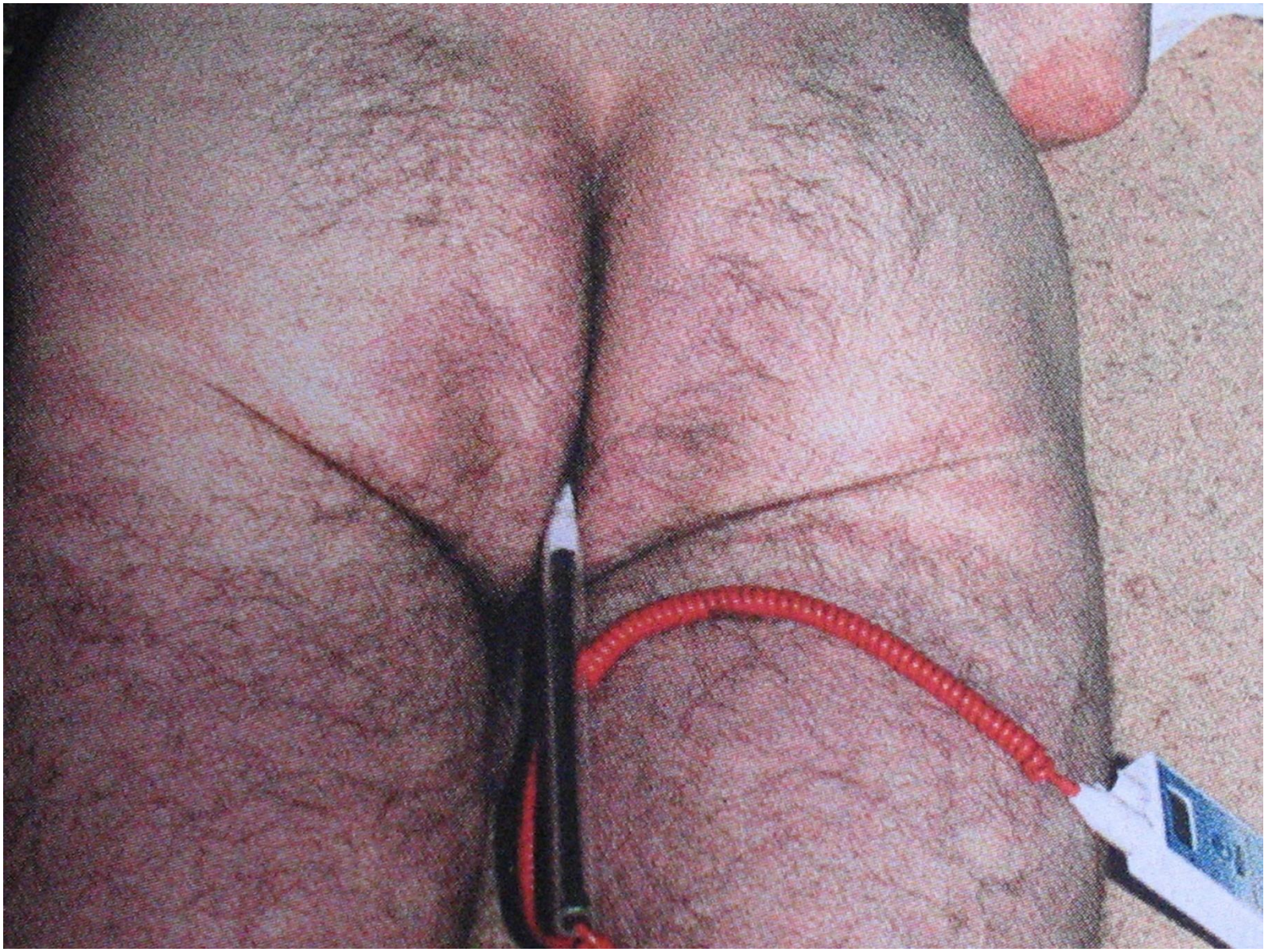
TECHNIQUE ctd.

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

TECHNIQUE ctd.

$$\text{Time since death} = \frac{99F^0 - \text{Rectal temp}}{\text{Rate of cooling}}$$

(In Colombo rate of cooling is 0.7- 0.8 F^0/ 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 F^0. 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.