The following analysis and table is taken from:

Henssge, C., Madea, B., Krompecher, T., Knight, B., & Nokes, L. (2002). *Estimation of the time since death in the early postmortem period.* **London: Hodder Arnold Publications.**

Analysis of algorithms in actual cases

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The use of eight different temperature methods to determine the time since death for eight corpses was examined. The various calculations may give the reader a useful insight into which method might best suit their particular circumstances.

Again, it is important to point out that it is not the intention to establish which is the most accurate method. The objective is to show the various calculations for each algorithm applied to practical case examples. The choice of the algorithms was based on the desire to illustrate the wide variation in application. Some require little mathematical ability by the user, whilst others require numerous calculations. For detailed explanations of how each algorithm was derived, the reader is referred to the appropriate references listed at the end of the chapter.

SUBJECTS AND METHODS

After admission to the mortuary, the bodies (of which the time of death was accurately known) were stripped, weighed and measured. They were then taken to a room where they were placed in a supine position on a plastic tray. Rectal temperatures were recorded using a calibrated thermocouple, connected

to a recorder which printed temperature readings every 30 minutes. The thermocouple was inserted approximately 6 cm into the rectum.

Table 2.3 shows the data from eight corpses, required to apply the eight algorithms. For ease of comparison, the first temperature reading (i.e. Temp 1) corresponds to the actual postmortem interval of 10 hours for each corpse.

APPLICATION OF ALGORITHMS

The following calculations correspond to corpse 1 in Table 2.3. The remaining corpses were similarly analysed and the results are presented in Table 2.4. All estimates were rounded to the nearest hour (h).

Rule of thumb[38]

The general method used by many to calculate the postmortem period involved the following two formulae. Note that the first rule of thumb method is in degrees Fahrenheit. If required, conversion from degrees Centigrade to degrees Fahrenheit is achieved by $(C \times [9/5]) + 32$.

METHOD A

$$\text{Time since death (TSD)} = \frac{\text{Rectal temperature at time of death (°F)} - \text{Rectal temperature at time } t1 \text{ (°F)}}{1.5}$$

$$\text{TSD} = \frac{98.6 - 80.6}{1.5} = 12 \text{ hours}$$

Table 2.3 *Data from eight corpses used to apply the eight algorithms*

Corpse	Age (years)	Height (m)	Weight (kg)	Temp 1 (T_1) (°C)	Temp 2 (T_2) (°C)	Interval between T_1 and T_2 (h)	Average environmental temp (°C)
1	95	1.65	48	27.0	26.2	1	15.0
2	93	1.72	80	27.6	26.8	1	15.5
3	69	1.60	70	29.4	29.0	1	19.0
4	90	1.60	60	32.2	31.3	1	17.5
5	80	1.50	50	30.7	29.8	1	15.4
6	77	1.67	82	31.9	31.2	1	16.0
7	70	1.67	50	30.8	29.9	1	18.0
8	79	1.57	64	31.4	30.7	1	16.0

Temp 1 is the rectal temperature after an actual postmortem interval of 10 hours.

Table 2.4 *Results of applying eight algorithms to data from eight corpses presented in Table 2.3*

Corpse	Rule of thumb		De Saram et al.[10]	Fiddes and Patten[3]	Marshall and Hoare[4]	Green and Wright[30]	Al-Alousi and Anderson[31]	Henssge et al.[34]
	(a)	(b)						
1	12	13	12	11	9	13	10	10
2	11	12	12	11	11	12	10	15
3	9	11	19	9	10	20	8	13
4	6	8	7	6	7	8	4	7
5	8	9	7	10	7	9	7	7
6	8	8	7	5	8	11	4	9
7	7	9	7	11	7	8	7	8
8	7	9	8	14	7	11	4	8

All estimates rounded to nearest hour. Actual postmortem interval is 10 hours.