

## ORIGINAL ARTICLE

## Videos have a role in postgraduate necropsy education

J L Burton, G Diercks-O'Brien, G N Ruttly

*J Clin Pathol* 2004;57:877–881. doi: 10.1136/jcp.2003.010637

See end of article for authors' affiliations

Correspondence to: Dr J L Burton, Academic Unit of Pathology, E-Floor, Medical School, Beech Hill Road, Sheffield, S10 2RX; j.l.burton@shef.ac.uk

Accepted for publication 14 January 2004

**Aims:** This is the first study to investigate the usefulness of structured, scripted videos as an adjunct to the mortuary based training of histopathology trainees in necropsy techniques.

**Methods:** Four structured and scripted videos describing aspects of necropsy health and safety, evisceration, general dissection techniques, specialist dissection techniques, and reconstruction were shown to histopathology trainees attending the 2001 University of Sheffield short course on the autopsy. Delegates who agreed to participate in the study were asked to complete a short questionnaire seeking Likert-type and free text responses concerning the usefulness of the videos in postgraduate necropsy training. Free text responses were analysed using a themed content analysis.

**Results:** All 38 delegates who viewed the videos agreed to participate in the study. Of these, 35 found the videos enjoyable and 34 found them interesting. Thirty one felt the videos enhanced their learning experience. Advantages of the videos included the ability to learn about specialist techniques rarely encountered in the mortuary, the ability to teach large numbers of students at once, allowing students to learn at their own pace, and as a tool for revision. Repetition between the videos, a lack of interactivity, and a lack of sufficient detail on general necropsy techniques were felt by participants to be the principal disadvantages of this teaching tool.

**Conclusions:** Videos are an acceptable teaching tool for students. They have a valuable role to play as an adjunct to dissection in teaching junior histopathology trainees about specialist necropsy dissection techniques.

The past 40 years have seen the publication of more than 26 000 articles on the necropsy. These deal with the usefulness and decline of the consent necropsy and the role of the necropsy in undergraduate medical education.<sup>1–7</sup> Therefore, it is surprising that, given intense public and professional interest in the necropsy,<sup>8</sup> and the efforts expended on elucidating its roles in undergraduate education, the literature on the education of histopathology trainees in necropsy practice is virtually non-existent.

Histopathology trainees have traditionally been taught necropsy techniques by an apprenticeship process with varying degrees of supervision. We aimed to see whether videos of necropsy techniques could be used to supplement and augment training in necropsy practice.

## METHODS

### Videos

In 2000, the University of Sheffield (UK) learning media unit produced a series of four structured, scripted necropsy training videos for medical education with the consent of the relatives of the deceased (table 1).<sup>9</sup> These were aimed at undergraduates and postgraduate histopathology trainees. The programmes were developed to be viewed individually or as a series. To our knowledge, this is the only video series of its kind in the world.

The video series was shown to delegates (senior house officers (SHOs) and specialist registrars (SpRs) in histopathology from around the UK) on the "2001 University of Sheffield short course on the autopsy" following a "live" necropsy demonstration. Because this research was intended to survey a new proposition, it was explorative in nature and used both quantitative and qualitative research methods. Consequently, the sample was not intended to be either comprehensive or representative.

Delegates who agreed to participate in our study completed a short questionnaire seeking categorical responses (strongly agree, agree, disagree, strongly disagree) to six "Likert-type"

questions, and free text responses to questions about the usefulness of the videos as a teaching medium (table 2). The answers to the Likert-type questions were collated and analysed in the statistics package SPSS Version 9.0. Given the sample size, only quantitative descriptive statistics were undertaken. Free text responses were subjected to a themed content analysis in which themes were derived by aggregating similar statements from within the responses.<sup>10 11</sup>

## RESULTS

All 38 delegates who viewed the videotape presentation completed a feedback questionnaire. Eighteen were SHOs, 19 were SpRs in histopathology, and one was of unknown grade.

### Quantitative analysis

Seventeen SHOs and 17 SpRs felt that the video presentations were of benefit to the course (strongly agree/agree), with 16 SHOs and 15 SpRs stating that the videos enhanced their learning experience. SHOs appeared to find the videos more beneficial than SpRs: 13 SHOs felt that it would have been difficult to learn as much about necropsies without viewing the videos, whereas 11 of the SpRs felt that this was the case. Moreover, SHOs were more likely (seven of 18 v one of 19) than SpRs to agree strongly that it would have been difficult to learn as much about necropsies without viewing the videos. Thirty four of the delegates strongly agreed/agreed that the videos were interesting and 35 enjoyed watching the videos. Tables 3–8 summarise the results.

### Qualitative analysis

Twenty six themes were identified and grouped into six "metathemes", namely: (1) the usefulness of the videos; (2) unhelpful aspects of the videos; (3) comparing the videos with mortuary based teaching; (4) how the videos could be improved; (5) how to view the videos; and (6) recommending

**Abbreviations:** SHO, senior house officer; SpR, specialist registrar

**Table 1** Contents of the necropsy video series used in our study

Video	Contents	Running time (minutes)
1	Health and safety, evisceration, and reconstruction	24
2	Hospital necropsies	21
3	Axial techniques	24
4	Specialist techniques	19

videos to colleagues (33 delegates reported that they would recommend the videos to their colleagues). Table 9 presents the (meta)themes.

**DISCUSSION**

Currently, trainee histopathologists must demonstrate competence in necropsy practice in addition to surgical pathology. Such competence has traditionally been acquired via an apprenticeship in the mortuary (perhaps with little supervision) and reference to the relatively few available textbooks on necropsy practice. The continued decline in the hospital necropsy rate during the past 20 years<sup>12-13</sup> means that trainees may struggle to gain sufficient exposure to standard and specialist techniques, particularly if they are unable to perform medicolegal necropsies.<sup>8</sup>

There is an extensive literature on the uses of the necropsy in medical practice and undergraduate medical education.<sup>14</sup> Given the increasing requirement that medical education be

grounded in educational theory and research,<sup>15</sup> it is perhaps surprising that there are only occasional studies investigating postmortem techniques.<sup>16</sup> No study has evaluated methods of postgraduate necropsy training. Previous studies have shown the usefulness of videos, video stills,<sup>17</sup> video links,<sup>5</sup> and computer assisted learning packages<sup>18-20</sup> in the teaching of morbid anatomy<sup>21</sup> and pathology to undergraduates. Ours is the first study to explore the use of videos as an adjunct to the mortuary based teaching of necropsy dissection techniques to histopathology trainees.

Using the survey as a research methodology,<sup>22-23</sup> with a questionnaire to collect a combination of quantitative and qualitative data, we have shown that structured, scripted videos may provide a useful adjunct to postgraduate training. Our study shows that such videos are acceptable to trainees, and enjoyable to watch. Furthermore, the trainees (and especially the SHOs) in our study subjectively felt that the videos enhanced their learning of necropsy techniques.

“The continued decline in the hospital necropsy rate during the past 20 years means that trainees may struggle to gain sufficient exposure to standard and specialist techniques”

Participants felt that videos demonstrating specialist techniques (techniques that all necropsy pathologists should be familiar with but which do not form part of every necropsy) were most relevant to their training. This probably reflects the declining hospital necropsy rate and concomitant decline in the opportunity to witness and perform such procedures. Moreover, it may reflect our intention when producing the videos that the demonstration of general necropsy procedures (video 2) would be mostly directed at the needs of undergraduates.

Producing the series of videos used in our study was both expensive and extremely time consuming, given the need for script writing, sound and film crews, editing, voice overs, and graphics. The four programmes were originally designed to be viewable both as a series and to stand alone. Judging from the qualitative data (metatheme 5), this objective was

**Table 2** Questionnaire prompts

Question style	Questions
Likert	The videos were of great benefit to this course The videos have enhanced my learning in this course It would have been difficult to learn as much about the necropsy without using the videos The videos were well integrated in the teaching of this course The videos were very interesting I enjoyed watching the videos
Free text response	Content of the videos What I found useful What I did not find useful Do you think the videos can be seen as a series, on their own, or in both ways? What benefits do you see in using the necropsy videos over traditional teaching methods? Would you recommend the videos to your colleagues, and if so, why? In what ways can the videos be improved? Have you any other comments?

**Table 3** Delegates' responses to the statement: the videos enhanced my learning experience on the course

	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree N (%)	Total N
Grade					
SHO	7 (38.9)	9 (50.0)	2 (11.1)	0 (0)	18
SpR	3 (16.7)	12 (66.7)	1 (5.6)	2 (11.1)	18
Unknown	0 (0)	1 (100)	0 (0)	0 (0)	1
Total	10 (27.0)	22 (59.5)	3 (8.1)	2 (5.4)	37

SHO, senior house officer; SpR, specialist registrar.

**Table 4** Delegates' responses to the statement: it would have been difficult to learn as much about the necropsy without using the videos

	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree N (%)	Total N
Grade					
SHO	7 (41.2)	6 (35.3)	3 (17.7)	1 (5.9)	17
SpR	1 (5.3)	10 (52.6)	7 (36.8)	1 (5.3)	19
Unknown	0 (0)	0 (0)	1 (100)	0 (0)	1
Total	8 (21.6)	16 (43.2)	11 (29.7)	2 (5.4)	37

SHO, senior house officer; SpR, specialist registrar.

**Table 5** Delegates' responses to the statement: the videos were of great benefit to the course

	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree N (%)	Total N
Grade					
SHO	9 (50.0)	8 (44.4)	1 (5.6)	0 (0)	18
SpR	6 (31.6)	11 (57.9)	1 (5.3)	1 (5.3)	19
Unknown	0 (0)	1 (100)	0 (0)	0 (0)	1
Total	15 (39.5)	20 (52.6)	2 (5.3)	1 (2.6)	38

SHO, senior house officer; SpR, specialist registrar.

**Table 6** Delegates' responses to the statement: the videos were well integrated into the course

	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree N (%)	Total N
Grade					
SHO	6 (33.3)	11 (61.1)	1 (5.6)	0 (0)	18
SpR	3 (15.8)	13 (68.4)	1 (5.3)	2 (10.5)	19
Unknown	0 (0)	1 (100)	0 (0)	0 (0)	1
Total	9 (23.7)	25 (65.8)	2 (5.3)	2 (5.3)	38

SHO, senior house officer; SpR, specialist registrar.

**Table 7** Delegates' responses to the statement: the videos were very interesting

	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree N (%)	Total N
Grade					
SHO	7 (38.9)	10 (55.6)	1 (5.6)	0 (0)	18
SpR	4 (21.1)	14 (73.7)	0 (0)	1 (5.3)	19
Unknown	0 (0)	1 (100)	0 (0)	0 (0)	1
Total	11 (29.0)	25 (65.8)	1 (2.6)	1 (2.6)	38

SHO, senior house officer; SpR, specialist registrar.

**Table 8** Delegates' responses to the statement: I enjoyed watching the videos

	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree N (%)	Total N
Grade					
SHO	5 (27.8)	13 (72.2)	0 (0)	0 (0)	18
SpR	3 (15.8)	14 (73.7)	1 (5.3)	1 (5.3)	19
Unknown	0 (0)	1 (100)	0 (0)	0 (0)	1
Total	8 (21.1)	28 (73.7)	1 (2.6)	1 (2.6)	38

SHO, senior house officer; SpR, specialist registrar.

**Table 9** Thematic analysis of qualitative data

Metatheme	Theme	N	Description	
(1) The usefulness of the videos	a	Teaching specialist necropsy techniques	17	Videos are useful in teaching specialist necropsy techniques (especially dissection of the spinal cord, middle ear, and eyes; videos 3 and 4)—for example, "seeing necropsy techniques that are not performed often was particularly useful"
	b	Teaching about health and safety	1	The videos are useful in teaching about "health and safety" (video 1)
	c	Giving a broad overview	1	The videos have a role to play in providing "a broad overview of general necropsy techniques" (video 2)
	d	Revision aid	1	The videos are a valuable tool for "reinforcement of previous knowledge and experience"
(2) Unhelpful aspects of the videos	e	Repetition	8	Repetition of various procedures was considered unhelpful. These included the programme introductions and evisceration of the brain. One respondent noted repeated viewing of the programmes (for example, "I have seen them several times now...") to be unhelpful
	f	Lack of detail	4	Insufficient attention was given to general necropsy dissection techniques (video 2)—for example, "(dissection of) abdominal and thoracic organs possibly not quite detailed enough", "more time needed on heart"
	g	No standard method of dissection	2	The techniques demonstrated differed from those described in the practical demonstration—for example, "every technique was different from this morning as shown live. Good to experience different ways but some conflict and disarray of thoughts"
	h	Technical aspects	1	Technical aspects of the video, such as the colour washing used during the introduction are distracting—for example, "the startling 2-3 minutes is an unnerving yellow orange colour"
	j	–	1	One delegate reported that the demonstration of the technique for "obtaining CSF from the 4th ventricle" was unhelpful, but did not state why
(3) Comparing the videos with mortuary based teaching	k	Specialist procedures	9	Videos excel over mortuary based teaching in the teaching of specialist necropsy techniques—for example, "can demonstrate methods which are not part of a 'normal' necropsy"
	l	Revision	7	Videos are a valuable tool for revising and reinforcing techniques learnt in the mortuary—for example, "can be used to reinforce traditional teaching methods"
	m	Clear and concise	6	Videos are clearer and more concise than other learning media—for example, "clear, straight forward explanations with good examples"
	n	Studying at one's own pace	5	Videos are valued over mortuary based teaching because they allow one to study at one's own speed—for example, "always available, can be studied alone" and "can rewind and watch again"
	o	Large group teaching	3	Videos are more amenable to large group teaching—for example, "enables large groups to gain teaching experience"
	p	Hands on teaching	7	Seven delegates noted that mortuary based teaching was superior to videos although most did not state why—for example, "seeing/doing the real thing teaches best", "always better to see PMs live". One delegate offered insight into this theme, observing that "hands on teaching can be easier to learn from"
	q	Interactivity	1	Videos lack interactivity because one "cannot interrupt to clarify doubts as opposed to a live demonstration"
(4) How the videos could be improved	r	Include more specialist techniques	5	The videos could have been more comprehensive and included "further rarely performed technique, demonstrations—for example, mesenteric vessels in ischaemic bowel, post-op hearts, forensic cases", "...[dissection of] internal carotid arteries, vertebral arteries...", and "more on middle/inner ear (dissection)"
	s	Give more detailed explanations	5	The videos would benefit from the inclusion of a more detailed explanation of some aspects of the necropsy—for example, "...step by step evisceration..." and making the dissection "slower to demonstrate unusual parts of the dissection"
	t	Reduce repetition	4	The videos could be improved by "by reducing repeated elements"
(5) How to use the videos	u	Versatile	24	The videos could equally be viewed individually or as a series
	v	View as a series	6	The videos were best viewed as a series, "maybe in association with relevant section(s) of (the) course"
	w	View individually	4	The videos would be best viewed individually, because "as a series there was some repetition of CNS evisceration"
(6) Recommending videos to colleagues	x	Informative and instructive	13	The videos were regarded as informative and instructive, especially for specialist techniques—for example, "specialist techniques are rarely taught", and "very informative didactic approach"
	y	Valuable departmental resource	4	The video series would be a valuable departmental resource—for example, "(would recommend) as a reference within a department", "they provide excellent clear demonstration which would be handy to have at our side"
	z	Of great practical value	4	Recommended using the videos as a practical aide to necropsy teaching because they were "very clear" and "of great practical value"
	α	Basic training	3	Would recommend that junior colleagues saw the videos "as a basic foundation" to learning necropsy techniques

CNS, central nervous system; CSF, cerebrospinal fluid; PM, postmortem.

### Take home messages

- Educational videos of necropsy techniques are expensive and time consuming to produce, and require the consent of the relatives of the deceased
- Videos can be an acceptable, enjoyable, and informative adjunct to mortuary based teaching
- Videos may be used to teach trainees about specialist dissection techniques rarely encountered in the mortuary
- Videos are especially useful for juniors at the start of their training

achieved. However, as a consequence, there was a necessary degree of repetition, which participants found distracting when viewing the programmes together (theme w). In aiming to give undergraduates an idea of what the necropsy entails, the demonstration of general necropsy techniques and eviscerations was regarded by some trainees as being too cursory to be helpful (theme f). Some technical aspects of the videos were not to the tastes of all delegates—such as the use of a colour wash over the images during the introductions to the programmes (theme h). Such issues should be borne in mind when designing future videos for necropsy teaching (metatheme 4).

Videos can be made accessible to large numbers of students at one time (via a data projector), and students may watch them on their own (or in small groups) in their own time and at their own pace (themes n and o). Videos can also deliver focused teaching on specific aspects of necropsy technique (themes k and m).

We conclude that videos can form a valuable and acceptable adjunct to mortuary based teaching when training histopathology trainees in necropsy techniques. Such videos appear most useful when demonstrating specialist techniques rarely encountered at necropsy to junior trainees, but continue to have a role for more experienced trainees revising for examinations.

### ACKNOWLEDGEMENTS

We would like to thank the staff at the University of Sheffield learning media unit, and especially Ms C Allam who assisted us in the production of the videos used in this study.

### Authors' affiliations

**Dr J L Burton**, Academic Unit of Pathology, University of Sheffield Medical School, Beech Hill Road, Sheffield S10 2RX, UK

**Ms G Diercks-O'Brien**, Learning Media Unit, University of Sheffield, 5 Favell Road, Sheffield S3 7QX, UK

**Prof. G N Ruty**, Division of Forensic Pathology, Robert Kilpatrick Building, Leicester Royal Infirmary, PO Box 65, Leicester LE2 7LX, UK

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