“It’s not just getting a biopsy”: Transposing ‘take-home’ messages from the operating theatre to a proforma

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Abstract

In this chapter we explore how surgical trainees and their supervisors construct ‘take-home’ messages - generic principles for future action- as the former operates under the guidance of the latter in the operating theatre and subsequently transposes these messages on a so-called workplace-based assessment (WBA) form. These forms are uploaded onto an online platform and count as evidence of learning for the trainee's annual review, which determines whether the trainee can continue their training or not. Adopting a social semiotic perspective, and drawing on video recordings, observations, interviews, and WBA forms, we explore how a trainee and supervisor constructed take-home messages as they rendered, read and recorded digital images during a surgical procedure, and how these messages were taken forward by the trainee in the form. We show, first, how trainee and supervisor jointly created a picture of an area of interest inside the patient’s body, interpreted the picture in terms of opportunities for future surgical intervention, and recorded it to facilitate preparations for a possible future intervention; and second, what take home messages were designed from this operative activity. We conclude with reflections on the value of turning a social semiotic eye onto (health care) organisations.

Introduction

This chapter explores how surgical trainees and their supervisors jointly make and re-make meaning, first, as they engage in clinical work in the multimodal environment of the operating theatre; and second, as they complete a written 'WBA form'. It is the first study to explore how the work-based assessment - a key intervention introduced in the United Kingdom by the royal surgical colleges in 2007 - is put into day-to-day practice.

Using video ethnographic fieldwork and a social semiotic frame, the chapter explores how a surgical trainee and his supervisor[i] jointly construct, re-construct and transpose 'take-home' messages as the work unfolds in the operating theatre, and in retrospect, as they complete the WBA form. We adopt the notion of a 'take-home message' from our focal trainee as a shorthand term for meanings that are extracted from ongoing semiosis and transformed and fixed in a way that they can 'travel' to and are relevant for other spatiotemporal contexts and parties. In this way, we contribute to the development of a multimodal notion of 'textual trajectories' (Maybin & Lillis 2017), i.e. ways of accounting for "the changes, movements and directionalities of texts - and relationships between these - across social space and time." (p409).

Our aim is, first, to explore the construction of messages as the interaction between trainee and supervisor unfolds in the operating theatre. What is it that trainee and supervisor draw attention to as they operate and supervise, respectively, using the semiotic resources available to them? How do they construct messages as the procedure unfolds? To what degree are their orientations and interests aligned? Second, we aim to explore the selection and transformation of messages onto the WBA form. What is included, and what is excluded?

How are they re-articulated in writing? What is gained and what is lost in this process of entextualisation? Third, we suggest factors shaping the (sequential) co-authoring of the messages: What are the conditions under which the forms are completed? What are the trainee's concerns as they complete the form? In so doing, we demonstrate some of the questions that social semiotics asks about (meaning making in) organisations, and the tools it has available to account for them. The questions also illustrate how social semiotics can help address questions from organisational studies, notably in relation to the emergent, unpredictable character of work, communication and learning (Iedema & Bezemer 2021), and organisational interventions (such as proformas) designed to manage these.

Social semiotics has previously highlighted the role of the body in communication in the operating theatre and other clinical environments (see Bezemer 2020 for an overview). As sign-makers, clinicians select and subject noticeable material forms and formations in their environment to interpretation. This includes the sounds that make up speech, for example, or the graphics displayed on a monitor, which stand for numbers that stand for, e.g., the patient's heart rate; as well as bodily forms and formations - postures or movements - produced by colleagues for practical purposes. For example, a scrub nurse routinely establishes when and how to assist a surgeon through ongoing readings of the surgeon's bodily actions, which to them, indicate what instruments the surgeon is likely to need next. In these instances, the communicative and practical functions of the body are inseparable, all the more so as teams work on the tacit agreement that colleagues should anticipate, rather than await requests.

Social semiotics ought to also concern itself with the ways in which clinicians (and patients) develop semiotic resources to *read* and communicate the *patient's* body as "an inextricably

complex *text*" (Sebeok 1985, p2, our emphasis). The underlying disposition of clinicians that shapes this 'body text reading' might be described as a 'professional vision' (Goodwin 1994), or more specifically, as the 'clinical gaze' (Foucault 1994). Of interest to us are "the terms […] that physicists […] have worked out to transpose sign processes of their fields of phenomena into the human language and that can be interpreted as translations (Jakobson 1971, cited in von Uexküll 1986, p209), though we would replace 'human language' with 'the modes available to them'. These meaning making practices underpin all clinical action and all expression in response to engagement with a patient body. It includes practices of seeing, touching and hearing through which the clinician comes to recognize forms as instances ('tokens') of categories ('types') developed and shared within the clinical community, and an expressive repertoire that enables them to represent and communicate about these forms.

In the operating theatre, modes of communication provide means for expressing understandings of the patient's condition. This includes possibilities for communicating sensory experiences. As clinicians inspect, palpate, auscultate, they make meaning, they attach meaning to corporeal forms. Speech, writing, drawing, and other modes of communication are available to articulate the meanings made, enabling them to develop joint accounts of the patient and 'calibrate' (Goodwin 2018) their understandings. Technologies assist health professionals by mediating sensory experiences; in the case we present in this chapter, surgeons use a camera to see inside a patient's throat, with the output rendered on a screen. They need to work to produce a picture of areas of interest, manipulating tools as well as the area of interest, before they can enter into discussions about what they see.

Clinical work, including surgery, is routinely reviewed and assessed, and the WBA is a case in point. This process is always mediated by modes and media of communication. For instance, a clinical event may be recorded in written notes or numbers representing judgements along pre-defined categories ('rating'). It may also be automatically recorded, e.g. as video or digital data from equipment, sensors and so on; all these recordings can be subjected to interpretation. Assessors express their interpretations and build joint accounts of (recollections or recordings of) events using speech, gesture, and so on; and may produce an official report, typically in writing. Assessing, then, is an instance of 'resemiotization' (Iedema 2003), in which meanings are made and re-made ('translated') according to specific needs and semiotic structures and possibilities for expression. This comes with a shift in focus from developing (shared) understandings of the patient to developing (shared) understandings of the clinician.

We adopt Kress's (2010) notion of design as the process of making "selections and arrangements of resources for making a specific message about a particular issue for a particular audience." Design is the process whereby the meanings of a designer (a teacher, a public speaker, but also, much more humbly and in a sense more significantly, participants in everyday interactions) become messages. Designs are based on (rhetorical) analyses, on aims and purposes of a rhetor, and they are then implemented through the instantiations of choices of many kinds" (p28). This is a prospective notion of design as "a means of projecting an individual's interest into their world with the intent of effect in the future" (p23). This tallies with our focal trainee's notion of the 'take-home' message as that which can be extracted from ongoing practice and ought to be recorded and remembered to support future action.

We develop an analysis of "…intertextual chains, i.e., pairs or series of communicative situations, or texts, in which (in some sense) the 'same' content, e.g., the same 'case', is treated" (Linell 1998, p149). We explore, first, a WBA form completed by a surgical trainee, and second, a video recording of the happenings in the operating theatre to which the form refers. We also draw on interviews with the trainee, which help us contextualise the forms and understand the ways in which the trainee weaves the WBA into day-to-day practice.

The WBA

The WBA refers to the assessment of a day-to-day activity undertaken in the working environment of a postgraduate surgical learner (Postgraduate Medical Education and Training Board Workplace Based Assessment Subcommittee 2005). In surgery, these activities are diverse. They range from interactions with patients, families, or colleagues in wards or clinics, through to the execution of precise technical skills in the procedural or operative setting. WBAs are one of several elements of a surgeon in training's learning portfolio that ought to demonstrate progress and development during the training programme. Their progress through their training programme is summatively assessed and recorded during formal Annual Review of Competence Progression (ARCP) meetings. An important marker for progress through these meetings is the appropriate completion of a pre-determined quota of WBAs. Although overall requirements differ between region and specialties, a typical trainee is currently expected to complete 40 WBAs each year. This equates to roughly one WBA event every week.

The WBA form reframes a work environment as a learning environment, and in so doing, mediates between two different sets of concerns, each under the primary responsibility of a different organisation. In the operating theatre, the orientation of trainee and supervisor shifts between a team's care for a patient (which is the primary responsibility of the hospital Trust and regulated by national protocols, guidelines and so on) and the assessment of the performance of an individual trainee (which is the primary responsibility of the royal colleges, who have set up the Joint Committee of the Surgical Curriculum to manage this). Yet on the WBA form, the assessment of the trainee is the sole focus. Put differently, as they

complete a WBA, surgeons shift between being clinician and trainee/supervisor, transposing meaning from one organisation - the hospital Trust - to another - the Joint Committee.

In the past two decades or so, organisations providing public services in the UK and elsewhere have come under significant pressure to adopt explicit 'standards' of practice and to routinely measure progress and improvement against these standards. The WBA is a manifestation of this trend in surgical education. WBAs were introduced to surgical training pathways in the mid-2000s as part of a large-scale, conceptual shift in medical education towards measuring learner competency in daily practice. Contemporary competency-based models of education now require learners to demonstrate competency in the workplace - namely that they have the knowledge, skills and attitudes required for independent practice as a specialist within their chosen field (Burg 1982). This means that the previously undefined and 'nebulous' educational activities, practices and processes now need to be made explicit. Furthermore, these educational activities need to be continually measured and assessed (Frank 2010, Holmboe 2010).

Policies commonly stress that these WBAs have a formative benefit for the learner. However, they also make explicit the use of WBAs in a (potentially high-stakes) summative capacity. For example, the curriculum for one surgical specialty describes the purpose of the WBA as follows (OMFS Surgical Curriculum 2018, p172):

- to provide short loop feedback between a supervisor and the learner
- to facilitate the provision of formative guidance
- to encompass the assessment of skills, knowledge, behaviour and attitudes during day-to-day surgical practice

- to inform educational supervisor's summative assessment at the completion of the placement
- to contribute towards a body of evidence held in the trainee's learning portfolio and be made available for the learner's annual review

This list starts with a focus on the formative nature of these exercises - each facilitating or stimulating formative guidance and feedback between learner and assessor/supervisor. However, as the list progresses, the rhetoric shifts towards the summative purpose of the WBA, both within particular placements - to decide whether learners have performed appropriately, and perhaps most significantly for the learner, to contribute towards evidence at a learner's annual review. This dual functionality has been confusing and controversial for the surgical community (Ali 2013).

Doing a WBA

An example of a WBA form is shown here as Figure 1. The form asks the authors to name the procedure that they report on, and to *give feedback on* and *assess* the performance of the trainee. The WBA shown here is an example of a so-called 'procedure-based assessment' (PBA). This is a direct observation of a more advanced surgical procedure or operation, which typically takes place in the operating room. Other WBAs look to examine practice during more simple clinical interventions (for example the 'direct observation of procedural skills' assessment), while other represent observed assessment of a learner's clinical skills in history taking, examination or information giving (the 'mini-clinical evaluation exercise') or can represent formal discussion related to an aspect of a patients care (case-based discussion).

Insert Figure 1 about here

The form shown here as Figure 1 was completed by a surgical trainee eight weeks after having been involved in a laryngoscopy. This is a diagnostic procedure aimed at examining the inside of a patient's throat to inform decision making about treatment.

One set of comments on this form reads as follows:

> (1) Microlaryngoscopy for confirmation of recurrence post CRT of glottis SCC (General)
>
> (2) Good understanding of the principles of the procedure and fluent in carrying out laryngoscopy confidently. Protects lips/teeth/gums throughout (feedback strengths)
>
> (3) Anticipate next steps in mapping/staging patient and appropriateness for laryngectomy. Inspect subglottis and extend of anterior spread into piriform fossa (feedback development needs)
>
> (4) Developing skills of using the rigid laryngoscope and Hopkins rod together (Feedback recommended actions)
>
> (5) Level 4b: As 4a and was able to anticipate, avoid and/or deal with common problems/complication (global rating).

The elliptic, one-to-two sentence comments are typical of what we found in the ten forms collected. The comments refer to *selected* features of the trainee's 'performance', reducing a series of events and conversations during a 20-min procedure in the operating theatre (which we will present in detail in the next section) to a handful of sentences. The comments refer to *areas of performance* in *shorthand formulations* (e.g. anticipating next steps, inspecting subglottis, using certain instruments), leaving much of what it means to perform in those areas unarticulated. As we shall show in the remainder of this chapter, these references to selected aspects of surgical work stand for vast bodies of embodied knowing and semiotic skills.

Crucially, performance in some areas is *evaluated* as 'good', 'fluent', 'confident' (1), and subsumed under the pre-given heading of 'general feedback' (1), 'feedback strength' (2), 'feedback development need' (3), 'feedback recommended actions' (4) and 'global rating' (5). The comments further suggest that *two authors* are involved: through third-person verb forms and use of imperative mood, the author of (2) and (3) positions themselves as a reviewer of another person's performance, while another author writes in the first person, commenting on their own performance:

> (6) I performed rigid laryngoscopy/pharyngoscopy for diagnosis and tumour mapping (to ascertain the local extent of cancer/ resectability) prior to total laryngectomy. (Trainee comments)

In the other sections of the form, the author is asked to evaluate the performance in different *stages* of the procedure. The available options to select are pre-given by the form. To illustrate using the form above, the pre-op planning domain is sub-divided into five steps (PL

1-5). For each step, the author chooses from the pre-existing options (N=not assessed, D = development required, S = satisfactory). The pre-op preparation stage is sub-divided into eight steps (PR 1-8). The next stage, exposure, is made up of four, and so on. In this case, all stages were evaluated as 'satisfactory'. The form needs to be submitted by the trainee to the online platform, and then validated on that platform by the assessor who observed the procedure. It is possible to submit, validate and upload the proforma without entering comments into the free-text spaces (1-4 and 6 above); only the numerical, global ratings (5) are mandatory.

Only in (6) does the form identify the expected author ('Trainee comments'). Sections 1-4 are headed 'feedback' and apparently for the supervisor to complete; all other fields are 'ratings' and apparently also for the supervisor to complete. However, trainees have indicated in interviews that they complete all sections themselves, and that supervisors generally expect their trainees to do so. Supervisors do still need to sign off or 'validate' the form online, and may take a closer look at what the trainee has actually written. Thus both supervisor and trainee are 'agents of entextualization' (Park and Bucholtz 2009, p486) in a complex co-authorship. As the trainee completes the supervisor's fields 'on behalf of' the supervisor, he considers carefully the image that he projects of himself, and the social implications of 'over or underselling' oneself:

> "I think I am one of those guys who will always put level three when the boss thinks I am level four. It feels a bit awkward if the boss looks at it and, I don't want the boss to feel that he has to downgrade it. So, I rather they upgrade it."
>
> (Interview with surgical trainee)

Trainees generally complete the forms two to eight weeks after the selected episodes took place (which raises interesting questions around the role of memory in the WBA reporting system), often in batches of five or more (this trainee sent off over fifteen forms to his supervisor to be validated in one batch), amidst a generally intense and heavy workload.

Against this brief background sketch of the way WBA forms are completed, it is no surprise that the forms do not simply 'transpose' meaning that was made by supervisor and trainee in the operating theatre. The point that meanings change as discourse is extracted from one context (in our case, the operating theatre) to another (the WBA platform that hosts the trainee's learning portfolio) has been well made. For example, Linell writes,

> "In no case are we faced with a true transfer of something; it is never the propagation of a fixed message across representational instances. Rather, it is a complex transformation, involving shifts of meaning and new perspectives, the accentuation of some semantic aspects and the accentuation or total elimination of others. Even what is usually understood as 'quoting' is a complex reconstruction process, which necessitates an analysis of both the quoted context and the quoting context." (Linell 1998, p148)

Some of the changes are a direct result of the time that's committed to 'doing the procedure' and 'doing the form'. The procedure that is the focus of the WBA in Figure 1 took twenty minutes; in other cases, this could be seven hours or more. In interviews, trainees reported they typically completed the form in five to ten minutes. This level of commitment alone limits the amount of meaning that can be extracted and represented on the form. The common use of ellipsis also (omission of agents, finite verbs) signals a preference for 'keeping it

short'. In practice, this means that the trainee aims to identify a 'take home message' from each procedure:

> "There is a key element. The take-home message from that procedure. Which you fill out, which probably is, I put it in recommended actions or development needs. Mapping. That's the learning point from this. Ok. All the other stuff I just fill up with bog standard copy paste stuff."
>
> (Interview with trainee)

Thus, the trainee does not seek to provide a detailed account of his learning experiences in the operating theatre. It is not merely a retrospective, high-level, subjective summary of learning experiences; rather, he selects and records what he believes is relevant for future performance, and, as noted above, what he believes supports the image he wants to project of himself as a learner to the supervisor and the assessment panel that may get sight of the form.

Other changes are the direct result of the fact that the shorthand references to performance *transcribe* meanings that were originally made in a range of different modes of representation and communication. Conversations between trainee and supervisor involving speech, gesture, facial expression, and so on, are reconstituted in writing. In that process, as indeed in any process of 'transcription', one is confronted with challenges that derive from differences between, e.g., speech and writing, or gesture and writing, i.e. differences in terms of the way that a mode has come to be structured and organised, to represent the world in specific ways (Kress 2010).

Conversations are not the only source of a WBA form. The WBA form discussed here is a procedure led one, i.e. focused on work in theatre, where trainees learn to manipulate tools and patient bodies, and learn to see the body in particular ways. As we shall see in the following section, giving feedback on performance that was given in this multimodal environment in words comes with significant losses, and some gains. In the WBA form discussed here, reference is made to practical action (e.g. 4), while also including messages that were derived from the spoken interaction (e.g. 3, as we shall see). We note in passing that were pen and paper used, as is often the case still in hospitals, users could move beyond writing and include, e.g., drawings, even if that's not what the form asks for. Yet the WBA is a digital form, making these kinds of transgression to accommodate a need for modes other than writing more difficult to achieve.

Video recordings of surgical performance

In the remainder of this chapter, we present video excerpts from the surgical procedure that was documented in the form shown above as Figure 1. The recordings were made by Tahim, along with recordings of five other participants in the study. In total, he recorded 10 sessions that were subsequently recorded on WBA forms. All participants have given consent to be filmed (Tahim, 2021).

As with the WBA form, we do not treat the video recordings as 'replicas' of what happened in the operating theatre. Their frame and angle reflect our interest in the surgical team, and they do not record a variety of other factors, such as touch, for example. Yet they do provide a detailed, elaborate registration of the activity that the supervisor and trainee are supposed to review in the WBA form. This enables us to explore the principles by which they reframe/re-present theatre happenings to fit the presumed requirements and expectations of the various future readers of the WBA.

The procedure in focus was done under general anaesthetic and involved visualising the vocal cords, using a laryngoscope (referred to in conversation as a "scope") in order to diagnose a vocal cord cancer. This scope was inserted through the patient's mouth, down behind the tongue allowing the trainee to directly inspect the vocal cord and surrounding areas for lesions. At this point, he was the only person able to look through the scope to see the operative field. However, a pencil-thin camera, placed through the scope allowed the view to be projected onto a monitor for other members of the team to share this view. Similarly, various instruments were placed down the scope at the same time as the camera, allowing for actions to be carried out (for example the suction tube, swabs to wipe and biopsy forceps).

Using these instruments, a small sample of tissue from the vocal cord could be taken as a biopsy, to be analysed for the presence of cancer.

Importantly for the trainee, this procedure was seen as an essential one for him to master. He had performed it several times before and was familiar with the set-up, equipment and techniques involved. He had also been working in this hospital for several months so was familiar with the team and the surgical specialist (who is also his supervisor for the procedure and assessor in the WBA). He reported during an informal discussion with Tahim later that, in preparation for taking part in the study, he and his assessor had spoken prior to the procedure and identified it as one that he could use as a WBA. In this way, his role as the main operator had already been determined. The procedure took approximately 20 minutes.

A first glimpse of the set up can be gleaned from Figure 2, highlighting the complex configuration of multiple people with different roles, orientated around a patient, along with different types of equipment – optic and visual equipment of the camera, surgical instruments and anaesthetic equipment.

Insert Figure 2 about here

We reviewed the 20-minute procedure in detail, identifying 119 micro-events –episodes involving sets of participants and oriented to specific areas of action and topics of conversation. They are plotted in a diagram represented here as Figure 3.

Insert Figure 3 about here

By reviewing descriptions of each micro-event, we identified two meaningful 'threads', i.e themes that were (re)articulated several times in the course of the procedure, highlighting specific concerns of the participants that they oriented to repeatedly, and that would seem possible candidates to become a 'take-home message' on the WBA form. Both illustrate surgeons' ways of embodied and verbal orientation to an area of interest (in or on the patient body) and drawing attention to, and naming, selected features in that area of interest, and considering possibilities for action; they also illustrate the need to facilitate vision, e.g. using optical technologies, and by manipulating the area of interest to obtain a view of particular structures (Bezemer 2019). The first candidate 'take-home message' that we draw attention to here was the need to get others to provide pressure on the patient's neck to enable the team to properly visualise the tumour and fix the desired view by taking pictures. This concern was not referred to on the WBA form. The second candidate 'take-home message' was to take advantage of the opportunity of the 'live' examination to see possibilities future surgical intervention. This, we suggest, was described on the WBA form by the trainee as 'anticipate next steps in mapping/staging'.

The video recordings highlight that the trainee and his supervisor were experiencing the procedure differently. The trainee, as the person who was performing the procedure and advocating for the various steps within it, was focused on handling the scope fluently and getting a biopsy. His supervisor supports him in achieving this, but moves beyond these immediate goals by planning (or 'mapping') for the next stage of treatment for this particular patient, establishing the best course of treatment for this patient, based not only on getting a biopsy, but also on making real-time observations of the surgical field which help to provide insight that could inform his next steps. All the while, the supervisor enacts a pedagogic

agenda – not only to guide the trainee through taking the biopsy, but also to help him understand the need to plan for the next stage, taking advantage of the possibilities presented by the procedure for examining and recording an area that they may need to operate on in the near future.

"You need to use the people around you as well" (to render objects of interest visible)

The following transcripts show how the supervisor (S) helped the trainee (T1) render the tumour visible by providing so-called 'cricoid' pressure. This leads him to emphasize the need to mobilise assistance. Another trainee (T2) is also present.

Insert Figure 4 about here

Figure 4A shows the operating trainee using both hands to manage the camera, placing it into the scope and advancing it down the metal tubing of the scope to see the tumour just beyond the end of the scope opening. He is looking at the screen, as is the supervisor. No words are being spoken as the trainee is trying to manoeuvre into an appropriate position. In Figure 4B, we see the supervisor stepping forward and moving his right hand past the operating trainee's shoulder to touch the patient, getting ready to provide 'cricoid pressure'. Following that, the trainee looks momentarily at the implement and asks T2 to 'assist a bit' (T2 had just offered help). T2 starts making a proposal, but at that point the supervisor steps in (Figure 4C) and makes an adjustment on the implement (he can reach the scope more easily from where he is), which the trainee's subsequent comments suggest results in the desired view of the vocal box.

Figure 5 shows what happens some 20 seconds later (at 4:21 on the recording). The supervisor positions his hand again to provide pressure (Figure 5A). Just at that point the trainee pulls back the scope, and the supervisor withdraws again (it doesn't look like any pressure was given). Moments later, the trainee asks his helper to provide the pressure.

Insert Figure 5 about here

Three-and-a-half minutes later, the trainee is advancing a pair of biopsy forceps down the scope. He is looking at the screen and sees the instrument enter the view and approaching the surgical site. We have included a diagrammatic representation of the view on-screen at this point in the transcript (Figure 6A). The tumour (red blur) is at the upper limit of what is visible through the scope. The diagram illustrates that about half of the lesion is obscured by the metal of the scope tube. So, while the edge of it is visible, the team cannot see enough of the tumour to take an appropriately sized biopsy.

Insert Figure 6 about here

When the operating trainee has his instrument fully advanced and is trying to get in position to take the biopsy, the supervisor, still closely monitoring the situation, announces that the operating trainee needs something (without saying what). He steps forward to the patient, placing his right hand on the throat of the patient and pushes down applying cricoid pressure, stating that "So you need that" and then "Let me try and give you that," with 'that' referring to the 'cricoid pressure' (Figure 6B).

The trainee did not communicate a need for help; he did not make a request. Yet the supervisor will have read the picture on the screen (which fails to show the tumour) as a sign that the operating trainee would benefit from facilitation that he as a supervisor is in a position to provide. More specifically, the supervisor reads a digitally rendered image of the patient's vocal cords as an artefact of the operating trainee's 'camera work', and, drawing on

his understanding of what is to be achieved (i.e. what counts as ‘a good picture’ in this procedure on this patient), establishes what auxiliary action might enable the operating trainee to achieve that.

The supervisor’s facilitation turns out to be effective. The pressure provided on the outside of the neck pushes the lesion inside the throat downwards into a better view down the scope, as shown on our diagram (Figure 6C). The trainee acknowledges the supervisor’s help (and the effect it has on the view) by thanking him. He is now about to get into a better position to take a tissue sample. As he manoeuvres, the supervisor begins to make a comment on the learning point which he wants to make (“and again it’s about knowing”), but stops himself as he watches the operating trainee take the biopsy. The supervisor then states he is satisfied that an appropriate biopsy is taken and approves “yeah, see that’s representative,” (implying that they may not have been sure to get a ‘representative sample’ had they tried to perform the biopsy with the previous view, i.e. without cricoid pressure). He then picks up a learning point that he has referred to before (“But you need to use the people around you as well”). Here he is implying that the learner needs to make use of the team to apply cricoid pressure, which will make it easier for him to (see the tumour and) take an appropriate biopsy.

Thus, in the course of this procedure the supervisor offers to give cricoid pressure four times, and the trainee asks his assistant to provide pressure once. Its value was re-iterated several times by the supervisor, and the trainee came to see its benefits first-hand. However, the trainee did not refer to this feedback in the WBA proforma (which was validated by the supervisor). The reasons could be multiple. He may not have considered this feedback at all when writing that statement. He may have interpreted or remembered the situation differently. He may have reasoned that he already knows that one needs to mobilise

assistance to obtain a good view. He may also have considered any acknowledgement of this feedback -contrary to the feedback on 'mapping' that we'll be discussing in the next section- as not fitting in with the expectations of a trainee's performance at his level of training and experience. For him, at his level of seniority, a fluently performed biopsy - documented and validated, may have been more important than recording feedback that could be seen as an invalidation of having achieved fluency in this procedure.

Although the trainee has not documented this feedback in the WBA proforma, the video record shows that his attention was drawn to its value and use. As the trainee struggled to visualise the tumour, the supervisor offered to perform the manoeuvre twice (in Figure 4B and Figure 5A), although on both of these occasions, the trainee did not take up these offers. However, despite not taking up these offers, on both occasions, the offers were noted and acknowledged by the trainee (in Figure 4, the trainee notices the supervisor attempting to provide cricoid pressure, while in Figure 5, he asks T2 to replicate the supervisor's actions). In other words, the trainee saw the supervisor offering to perform the manoeuvre, and in doing so, realised it was something this supervisor deemed important, and of potential use in this situation. This recognition of its value was then manifested by the trainee's subsequent action as he recruited T2 to apply the manoeuvre instead of his supervisor, while he continued the procedure. Through recruiting T2, he demonstrated to his supervisor that he had firstly recognised the supervisor's efforts to apply the manoeuvre, secondly that he realised it was a valuable manoeuvre and thirdly that he was able work independently from the supervisor, using the other team members around him.

The learning experience continued through the action of taking a biopsy, where the trainee saw the direct consequence, in real working practice, of using this technique. In this example,

it allowed him to take a “representative” biopsy. Figure 6A (top) was the view that the trainee and his supervisor shared without the application of pressure. When the supervisor pressed down on the neck, the trainee saw explicitly the improved view (Figure 6C (top)), which directly and immediately enabled him to obtain a suitable tissue sample; the effectiveness of the technique was proven. He incorporated this into his subsequent practice, directing his helper to once again to apply this pressure. In doing so, he demonstrated his recognition that this remained a useful thing to do and that he was able to apply it correctly and independently of his supervisor’s prompts.

In the course of this procedure, the trainee took increasing ownership of the manoeuvre, acting with increasing autonomy, shown by his ever-more explicit directions to T2. Initially the supervisor made the move to apply cricoid pressure with no prompt (Figure 4), which the trainee noticed. Later in the procedure, when there was a similar problem, the supervisor again made the move to apply cricoid pressure, which the trainee again noticed (not shown). The next time, the trainee asks T2 directly to apply the manoeuvre instead (Figure 5).

“It’s not just getting a biopsy”: Seeing possibilities for future action

The second thread begins with a conversation between the trainee and his supervisor that went on for just under a minute. Prior to the start of the procedure, the supervisor has approached the trainee who is washing his hands. He follows the trainee as he walks over to the operating table and sits down on an operating stool, and highlights to the trainee the purpose of the procedure.

Insert Figure 7 about here

The following excerpts show how the supervisor enacts this lesson of seeing possibilities for future surgical intervention as they jointly examine the operative field.

Insert Figure 8 about here

Somewhat later, the supervisor repeats his point about the laser (“I don’t think I can do that with a laser you know coz it’s just coming in the subglottis it’s coming off“). A little later again he notices that “the interesting thing is it’s a narrow field laryngectomy, which is good.” Again, somewhat later he says “I’m sure it’ll be fine because there’s no disease there anyway. Coz you gotta remember that you’ll enter won’t you at this point”. As he makes this utterance, he walks over to the screen to point at the reference of ‘this point’, as illustrated in Figure 9.

Insert Figure 9 about here

This collection of segments draws together exchanges that relate to a key point made by the supervisor. He first introduced it to the discussion as an addendum to a previous conversation ("but also, at this stage, you know") while the trainee was in the process of washing his hands. Initially, he was not clear exactly where the supervisor was trying take him, but in the course of that segment, the supervisor probed, asking him what the indication for this procedure was, and then guiding him through a process of re-framing his thoughts about these reasons (e.g. "not just concerns"). By the end of Figure 7, it appeared the trainee had come to understand that the assessor was driving him towards an answer related to "mapping" the next stages of treatment for this patient.

During the conversation that takes place in Figure 7, the trainee and his supervisor discussed the "mapping" principle *in abstracto*, based on predications and guesswork, rather than situated in the here-and-now of this patient – what they might find, rather than what they have found. They made few explicit links to the patient that was on the operating table. In the next segments, as the learner controlled the instruments to allow them to identify the presence of a recurrent cancer and to investigate its extent, the assessor began to emphasise exactly what it was that he saw that was helping him work out a plan for the future, and why. In this way, these segments demonstrate how the concept of "it's not just a biopsy" is put into practice, and what it encompasses. The previously discussed 'lesson' highlighted the need to obtain an appropriate picture of the object of interest by adjusting the hand-held camera and applying pressure on the patient, which in turn demands visual attention to both screen and implement, and calls for assistance. The present lesson highlights the semiotic work of drawing a virtual map over the picture thus obtained that highlights destinations and routes that are fit for the implements – vehicles - to be used, and fixing the pictorial basis for this map for future reference by taking a 'snapshot' at the right time. Indeed, the metaphor of

‘mapping’ - building a map - is an apt descriptor of what the supervisor is doing and drawing attention to.

The recording of this message on the WBA proforma is telling for two reasons. Firstly, as a reification of lived experience, it demonstrates how the supervisor’s ‘take-home message’, related to the concept of “not just a biopsy”, gets ‘translated’ -transformed- by the trainee as ‘mapping’, and therefore personally meaningful to him. It was documented twice in his WBA document (Figure 1) as “Anticipate next step in mapping/staging patient and appropriateness of laryngectomy” and “I performed rigid laryngoscopy for diagnostic confirmation and tumour mapping.” While the term “mapping” was not used explicitly by the supervisor during the procedure itself, it appears in line with what the supervisor was drawing attention to during the procedure. Importantly, it also matches his level as an ‘ST5’ trainee (ENT Surgical Curriculum 2021, p70). The trainee is aware that at this level, he needs to demonstrate that he is able to perform this procedure independently, fluently and effectively. A narrative about ‘mapping’ the next stage of this patient’s management may well have been seen as more favourable to portray in his WBA, than one that centred on a technical learning point around applying cricoid pressure, which may help explain its inclusion in the WBA form by this trainee.

Discussion and conclusion

Our account has drawn attention to a range of semiotic, embodied practices that surgeons deployed both during and after the operation, including positioning a camera and manipulating its surround to obtain a picture that enables exploration of an area of interest; anticipating needs for, and offering and requesting, practical facilitation; interpreting digital renderings, re-imagining them as route maps for future interventions, and communicating about selected features to achieve shared understandings. We highlighted the messages that surgeons co-designed as they rendered, read, and recorded digital images of a patient's vocal box, and the selective transformation and transposition of these messages -their re-design- onto the WBA form by the trainee. We thus portrayed work in a complex organisation that is often characterised for its 'technical' demands (c. the notion of a surgeon's dexterity) as *semiotic work* (Kress 2010).

Our account also offers insight into the ways in which a policy intervention is put into practice. The WBA was introduced to standardize and monitor the quality of surgical training. We have shown how a trainee and supervisor adopt and adapt this intervention, to fit the demands of their day-to-day routines of surgical trainees and their supervisors, and the long-term interests of trainees to complete their training. In so doing we hope to have clarified some of

> " the problems that clinicians have in coordinating complex services that straddle specialities […]; the struggles that result from policy makers seeking to reform hospital organizations and restructure workforce capabilities and rights […], or the organizational-cultural and educational challenges that face health care workers in

> structuring and integrating their services in ways that benefit the patient […]." (Iedema 2007, p5-6)

Our account shows that the WBA form must not be treated as a complete record of what was learnt or taught. Not all messages emerging from the interaction between trainee and supervisor make it into the WBA form. When using the forms as a basis for further assessment, it should also be borne in mind that they are likely to have been co-authored. Indeed, in our example, it was the trainee who drafted the feedback messages on the form, giving him significant power over the selection and recording process. He indicated he considers the impression he gives of himself - not wanting to over- (or under-) sell himself - as he completes parts of the form on behalf of the supervisor, knowing that they need to sign it off. We also highlighted that the work of completing forms is usually done in batches, with no more than five minutes spent on each, sometimes several months after the event. These practices do not necessarily 'invalidate' the form. Indeed while the trainee in our example omitted what appeared to be a recurring message from the supervisor, the feedback he did record on behalf of the supervisor appeared to be in line with the message that emerged in the operating theatre, and, crucially, with his level of experience.

We noted that feedback was articulated by the supervisor in different multimodal configurations. As the team are setting up for the operation, the supervisor constructs a monologue about what this type of operation is for beyond taking a biopsy. Then, once a picture of the area of interest in the patient had been achieved and all orient to it, he spoke 'to' the picture, verbalising and pointing at the opportunities he saw for future interventions. At this stage, trainee and supervisor jointly enacted the supervisor's message from just before the start of the procedure. Eight weeks later, as the trainee completed the WBA, he remade

the message once again, as a generic principle for future action. Each of these configurations enabled trainee and supervisor to make different kinds of statements about the world, ranging from prospectively oriented ones (abstract, elaborate instructions prior to, and abstract, shorthand instructions after the procedure) to instructions focused on the here-and-now of a concrete procedure.

While the WBA is not a complete *record of* learning, it does create *opportunities for* learning at the workplace. In the operating theatre, the trainee was led to perform the procedure, while the supervisor provided a running commentary, giving feedback. We noted that the trainee took up some of the feedback in the course of the operation (he started asking his assistant to provide cricoid pressure), while writing up other feedback on the form ('mapping'). The feedback in theatre may have been given even if the trainee had not selected the case for inclusion as a WBA; and the trainee may have reflected on the value of 'mapping' even if he had not completed the form. Yet the WBA helps protect these opportunities in conditions of high workload and pressures, ensuring that trainees do receive feedback on at least some of the cases, and that they reflect postoperatively on at least some of the cases, however brief.

We end this chapter with two closing remarks. First, we hope to have shown that social semiotics offers apt means to prise open concrete instances of (technology-enhanced) meaning making in organisations, advancing understanding of professional practices of seeing, manipulating, and communicating about, physical-material phenomena; the ways in which 'newcomers' are inducted into these practices; and how their 'performance' is documented and accounted for. Second, we hope to have shown that (health care) organisations offer a prime site for social semiotics to advance its theoretical and methodological apparatus. It is here that we can observe some of the most complex forms of

human cooperation and semiosis in action, in our case oriented to the delivery of services that have an immediate impact on the health and wellbeing of the public. As *social* semioticians, that environment will remain a go-to site for further research.

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[i] In the case presented here, both the trainee and supervisor are male.