

Technology and work within emergency medicine

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Introduction

From medical research it has been recognized that physicians doing medical work in the pre-hospital area can make a difference for the acutely ill people, meaning higher survival (Høyer, Schønemann). In the light of this it has during the last years – in the biggest cities in Denmark – been implemented that anaesthesiologists¹, employed at level 1 hospitals, can sometimes be on duty outside the hospital; some shifts they work in hospital, other shifts they perform in the pre-hospital field. No matter where they work – if they are in or out of hospital – their tasks are the same – they support human life on the most basic, physical level – and they are mobile and carry out nomadic work (using the definitions of mobility and nomadicity, as described in Bogdan (2006). However spaces and places in which they work, the degree of mobility and nomadicity, they ‘practice’, and the artefacts and technologies, they make use of, are most often of very diverse character.

Below I describe the characteristics for the mobile and nomadic work for the two different work situations of an anaesthesiologist – in-hospital and pre-hospital – and in these descriptions I include description of which technologies are used and how they are used.

The paper builds on use-driven research carried out through the last 3½ years within the context of the PalCom project (PalCom). As a part of the research we have carried out extensive fieldstudies within the emergency response area, have held interviews and have had a series of different workshops with the different responders. The work is described in more detail in (Kristensen, 2006 (1) Kristensen, 2006 (2), Kyng, 2006).

Anaesthesiologists on duty in- hospital

An anaesthesiologist on duty at the hospital takes care of the basic physical treatment of seriously ill people. Some of their time they spent in the Intensive Care ward, planning and monitoring the treatment of the patients in respirators. Moreover they are responsible for prescriptions of and carrying out anaesthesia for all those who are operated. They are also called for help when patients at the hospital get cardiac arrest, have pain that can not sufficiently be treated by other specialists, or when special catheters have to be placed in the more central part of the blood circulation system. So, anaesthesiologists on duty in-hospital can be described as a kind of ‘handy-man’ regarding everything belonging to keeping up the basic functions of the body.

Mobility and Nomadicity

Due to the tasks described above the anaesthesiologists at hospital are very mobile – they are moving around (walking) almost all the time during their duty. Their main working areas are the intensive care unit, the operating ward and the recovery ward – and they shuttle between these units and the patients there who need their attention and professional knowledge – but several times during a duty they also go to other wards around the hospital for treatment or supervisory examinations of severely ill patients. The anaesthesiologist on duty works in loads of different collaborative or units during a shift. His/her ‘basic group’ is the other anaesthesiologists and the

¹ An anaesthesiologist is a physician trained in administration of anaesthetics, treatment of pain and use of life-support systems (e.g. tubes, respirators or infusions) in critical care medicine

group of nurse anaesthetists but carrying out a specific task is most often done *not* with people from this basic group but with healthcare professionals within other specialties and of course the patients and relatives. So, the different work constellations change all the time – and people do not always know each other personally, but anyhow the mutual division of roles is relatively clearly defined.

Space and Place

The work *space* of the in-hospital anaesthesiologist can best be described as ‘the whole hospital’. However this superior space can be divided into different (smaller and smaller) subspaces, where the (maybe) narrowest space could be described as ‘a bed with a patient’. No matter which level of space we look at – superior or sub – it is basically wellknown to the anaesthesiologist – or, maybe, more precisely the *characteristics* of the space – the hospital, the wards, the walking areas, the offices, the lab’s etc – are wellknown. Everything is build and organized in *hospital-style*.

Because of the high degree of mobility and nomadicity, *place-making* takes place all the time. However this place-making can be looked at in different levels; on a kind of meta-level the in-hospital working physician works in a well-known and – of him/her – well-defined place. On a micro-level he/she has to ‘set up the place’ all the time – every time a new situation is dealt with.

Technologies and Artefacts

The anaesthesiologist in-hospital makes use of many complex and modern technologies to support his/her work. To mention a few: Heart/lung machines, respirators, kidney machines, infusion pumps and different kinds of sophisticated sensor equipment. Most of this equipment is pretty heavy and huge and cannot easily be moved around. The anaesthesiologist also makes use of a huge range of paper documents, most of which is somehow related with the medical record. Some parts of the medical record are today in electronic form, so the anaesthesiologist also have to make use of pc’s for handling this part of the documentation work.

The pre-hospital physician at work

Being the pre-hospital physician on duty means being called to acute medical incidents (people are injured or acutely ill) where it can make a positive difference with medical aid. The incident can be everything where humans are directly involved (damaged or ill) or are in a potential risk for injuries. Most often the pre-hospital physicians are called to people with symptoms on cardiac arrest suddenly occurred respiratory problems or unconsciousness or people injured in the case of traffic accidents or accidents in homes or in workplaces. Thereby the specific tasks of the pre-hospital physician can be very diverse, but the overall goal is to observe and do life-saving treatment of people; to establish and/or maintain free airways, breathing and blood circulation.

Mobility and Nomadicity

The pre-hospital physician move around in a special equipped medical mobile unit, driven by an experienced trained paramedic. This crew use the ambulance/fire station as their base – it is here they meet, when they begin their shift, and here they sleep, eat, drink coffee and relax. They also carry out some administrative tasks here. Most often they have several short stays in these surroundings during their shift, but it happens that they spend all their time ‘on the road’, moving directly from one response situation to another. As might be obvious a pre-hospital physician will be in several, almost constantly changing collaborative relationships during a shift. First of all s/he goes with the same driver during a specific shift, but it might not be the same driver from shift to shift. Additionally the most typical relations will be the staff in the different ambulances they meet in specific situations, and also staff, manning fire trucks, police cars, etc, in incident emergency

response. In these situations they also collaborate with staff in the emergency room(s) at hospital, the coordinator at hospital and maybe external resource persons. Moreover, of course, they also collaborate with those who are sick or injured, and – often – their relatives. Also ‘the public’ should be mentioned as a ‘group’ of people that can become an integral collaborative partner. So, the collaborative constellations the pre-hospital physician will be in during a shift are much broader than when being in-hospital.

Place and Space

The physical conditions for the pre-hospital work are – also as the word says – everything else *but* the hospital. Only in the situations where the pre-hospital physician follows an acute patient to the emergency room, s/he will go into the hospital – but only to hand over the patient to the hospital staff. So, working as a physician in the pre-hospital environment can mean everything; in people’s (very different) homes, in workplaces, at locations where leisure time is spent or where transportation is carried out. Often the space is in the open, meaning special attention is drawn to the weather, the season and the time of the day. Always changing space means that *place-making* also takes place all the time – the pre-hospital physician has to turn every (new) space s/he enters into a (medical) emergency response place. Essential here is that not only is this necessary – the time for doing it is short (or almost non-existing); s/he cannot spend time on staging – or ‘finding’ the place – it is (have to be) a place in the moment the responders turn up. So, (medical) emergency responders must find – or define – their place for carrying out the response, most often in unknown places and without spending time on it. And they do it! This could point to that place-making is more (or also) to a very high degree a mental process. However it is also a matter of use of technologies and artefacts – no one who gets close to an incident site where emergency responders operate doubts on what is going on and where the limits between ‘the emergency response area’ and ‘the rest of the world’ is.

Technologies and Artefacts

The technologies in use in pre-hospital emergency response are numerous and of very diverse character. Fire trucks, police cars and ambulances (and maybe other) have typically two functions: a) being used for the original purpose, and b) being used as an integral part of the cordoning-off process and organization – to make a clear boundary between ‘the accident’ and ‘the surroundings’. So, they are used as artefacts in the place-making process. Other specific technologies are also used for more definite purposes. Regarding the medical response, the physician (and/or the paramedics) brings many different medical technologies and artefacts. To mention the most central: Portable (but heavy) monitoring equipment, medication, infusion systems, ventilation systems, tubes neck-collars, blankets and stretchers. For the mutual communication at scene all the rescuers use radios. But also mobile phones play a central role in communication, especially with ‘the world outside’. As a part of the documentation process – but which also forms a part of the communication with ‘the world outside’, the pre-hospital physician uses a 2-pages highly structured paper record. S/he has to fill that out at scene – it has to follow the injured/ill person. One characteristic of these medical technologies and artefacts are that *they are all kept comparatively simple*.

Discussion

In this paper I have described the characteristics for the in-hospital anaesthesiologist’s work and for the pre-hospital physician’s work, with focus on the tasks, mobility and nomadicity, space and place and technologies and artefacts. It is all described on the basis of fieldstudies and interviews and is not as such analyzed. However, as I see it, there *is* a link between *all* the entities (the tasks, mobility

and nomadicity, space and place and technologies and artefacts) – when trying to understand the use of technologies and artefacts in mobile and nomadic work – at least the kind I have described – we *also* have to take into account the space- and place angle. By relating them to each other, it seems as the more complex and unforeseeable the situation is – regarding the tasks to carry out, the ‘degree’ of mobility and nomadicity and the conditions for establishment of ‘ad hoc’ – or ‘interim’ places – the more simple the technologies seem to be. This might give us some input to the design of technologies for use in mobile and nomadic work?

References

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