Communication with non-native callers in medical emergency calls: Recommendations for training and evaluating...

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Communication with non-native callers in medical emergency calls:

Recommendations for AMK operators and leadership

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Introduction

"I cannot be there to see and help the patient myself, the caller must be my eyes and my hands… we really need to understand each other."

- medical emergency call operator

This report is for medical emergency call operators in Norway. It focuses on communication, providing information, guidance, and practical advice to help operators communicate with callers who speak neither Norwegian nor English well. Besides offering background and recommendations for operators' own professional development and training, the report could be informative for leadership at Acute Medical Communications Central (AMK central), especially for the design and implementation of training and evaluation programs.

In Norway, medical emergency call operators (hereafter referred to as "AMK operators") answer calls to 113. A caller to 113 could be the person who requires medical help; however, callers often contact AMK central on behalf of a third person who is unable to call (the "patient"). AMK operators must decide whether the caller's description of the patient's medical situation indicates that it is necessary to immediately dispatch emergency services, such as an ambulance. Operators make this decision by obtaining information from the caller using questions from a criteria-based medical index, called "The Norwegian Index to Emergency Medical Help" [1-2]. AMK operators speak Norwegian; most can speak English as well. However, some callers speak neither language well (hereafter referred to as "non-native callers"), which makes the securing of accurate information more challenging. Language differences can lead to misunderstandings and conflicts between AMK operators and non-native callers. This report presents strategies operators can use to improve and develop their own communication skills with non-native callers. The implementation of these recommendations depends on more than simply reading this report; it requires an ongoing training program within AMK (see chapter "Advice to the AMK leadership and administration"). This report therefore provides an introduction to key concepts and a foundation for training.

Project goals

The primary goal of the project that led to this report was to provide practice-relevant, concrete recommendations to AMK operators to improve the effectiveness of their communication with non-native callers. The recommendations in this report have emerged from our observations and analysis of successful practices that AMK operators are currently using. Our aim is to help AMK operators understand the details underlying these practices so that they can make as many calls as possible into successful calls, both in terms of appropriate deployment of material resources and in terms of giving appropriate and clear advice to the caller. As mentioned previously, patients, non-native callers, and operators all benefit from more effective communication. In addition, the benefits may apply to medical emergency calls where communication is more challenging than normal (e.g., calls from children, some elderly, or callers compromised by drugs or alcohol).

On the use of these recommendations outside the AMK setting. Although some of the recommendations outlined in this report might be applicable to other communicative situations, this report addresses a very specific setting, and the recommendations are tailored to fit that setting. Four key features of the setting that have shaped the recommendations are: (1) the call presents a possible emergency, which imposes tight constraints on time, (2) the AMK operators have a particular assignment to follow, (3) the conversation takes place on the telephone, and (4) the caller is a non-native speaker. (Each of these parameters is elaborated in later sections.) Some of the recommendations will therefore be unsuitable in other settings, and the application of these recommendations outside the one addressed in this report should be done with that in mind.

A note about culture. This report does not go into details concerning cultural sensitivity, competence, and understanding. However, it is worth mentioning some short points on the matter. In general, people have both positive and negative stereotypes towards other groups of people, whether these groups are sport fans, chess enthusiasts, the wealthy, the impoverished, or immigrants. Some of the stereotypes might fit characteristics of the group, others will not. But, accuracy aside, what is certain is that these stereotypes never fit all members of the particular group. It is therefore important for AMK operators to be able to perceive and interact with the individual behind the stereotype they might hold about the group. If not, the operator can make critical mistakes, because his or her decisions may have been based on an interpretation of circumstances and information that has been coloured by the stereotype. In order to meet callers as individuals, AMK operators first need to be aware of their own stereotypes towards different groups, and second, have an open mind, being aware that the caller might be very different from what the operator might have expected at first. (For those interested in more information on cultural sensitivity in an emergency setting, we suggest reading Halvor Nordby's book *Etikk og kommunikasjon*, chapters 6 and 7 [3].) One of the fundamental purposes driving the recommendations in this report was to provide practical means for helping operators to stay focused, not only on each caller as an individual, but on each moment in the call as it unfolds.

The following section describes the project background, organization, goals, and basic methodology. These sections give insight into the process that led to the recommendations, and, as such, readers who are AMK operators might find them useful.

Project background

In recent years, Norway has experienced a major demographic change in the form of immigration from distant countries. As of 2010, more than 11% of the population in Norway (27% in Oslo) are immigrants themselves or descendents of immigrants. A small number of immigrants has lived in Norway since the 1970's and early 1980's, but as many as 40% have lived in Norway for less than four years [4]. In addition to these permanently settled immigrants, Oslo has experienced an increasing number of short term labour migrants and tourists who might speak little or no Norwegian/English at all. AMK operators therefore encounter callers with a wide range of Norwegian/English language abilities and knowledge about the Norwegian medical system. These demographic changes have created several challenges to public service in general. The Norwegian Health Authority's goal in this respect is to create a healthcare service that gives an equal health outcome to all (i.e., similar healthcare needs should receive similar effective healthcare services). This goal includes emergency services. In addition to an overarching need for adjustments of public services, the AMK system and AMK operators themselves have stated the need for training that specifically targets improvement on calls made by immigrants or non-native speakers.

The Acute Medical Communications Center (AMK central). One of the measures of a civilized society is the extent to which it provides emergency care for the seriously ill. Prioritization (i.e., triage) and dispatching systems are the first steps in the delivery of emergency services [5]. Since 1990, 113 has been the nationwide medical emergency number and is answered at Emergency Medical Dispatch Centers located in hospitals across Norway [6]. The operators' key triage tool is a criteria-based dispatch system based on the consensus document, "The Norwegian Index to Emergency Medical Help", which the operators have available in both Norwegian [2] and English [1]. The Index provides operators with a systematic prioritization of questions and instructions, and it is the backbone of all calls to 113.

On the role of the AMK at Oslo University Hospital, Ullevål. The Dispatch Centre at Oslo University Hospital, Ullevål covers the capital city Oslo and the surrounding area, which includes a population of approximately 1, 1 million. In 2009, this dispatch center alone handled 84 235 calls and initiated more than 120 000 ambulance- and/or air-ambulance missions [7]. In an average day, AMK Ullevål has 18 ambulances available for the city of Oslo and approximately 25 ambulances for outlying areas (e.g., Asker, Bærum, Øvre Romerike).

On the use of sound logs at AMK. A 'sound log' is a system of documentation used at AMK, including an audio-recording of the telephone call itself and a record of operator activities (such

as when he or she typed information into the system), dispatcher activities (such as when ambulance was dispatched), and ambulance activities (such as when the ambulance arrived). The Ministry of Health and Care Services has stated that AMK are required to use sound logs on all telephone lines [8] and log all "important traffic" [9]. Thus all calls to 113 are documented. The primary purpose of such detailed logging is to ensure adequate response and proper documentation. For example, the logs can serve as documentation in cases of formal complaints. The secondary purpose of sound logs is to be a tool for training, evaluation, and quality improvement of the service. Logs used for this purpose are required to have all identifying information about the patient erased [9].

On the role of the AMK operators. A caller's request for an ambulance alone is rarely sufficient for ambulance dispatch. Instead, the request initiates a triage phase in the call during which the operator decides whether the patient's medical condition fits the criteria for ambulance dispatch [10] or whether alternative medical services might be more suitable. During this phase of the call, the operator must gather critical and relevant information as quickly as possible. Although the operators are assisted by a number of computer-based resources (e.g., call tracing, maps, and directories), the caller is the operator's "key resource" for securing information as to the patient's location and condition [11]. The extent to which this key resource is useful is widely recognized as depending on the effectiveness of communication between caller and operator [e.g., 10, 11-16]. The AMK operators must make their decisions in a very time-limited setting, often on the basis of partial, perhaps unreliable information, without knowing whether significant pieces of relevant information have been made available during the conversation [17]. Even after the operator has made a decision as to which medical services would serve the patient most appropriately (e.g., sending an ambulance, other means of transport, going to Legevakt, consulting the General Practitioner), information sharing between operator and caller remains critical. If the operator has sent an ambulance, he or she might need to guide the caller in starting first-aid until the arrival of the first emergency units. If the operator has decided that an alternative service is more suitable, he or she must explain how the caller can access those services. Again, the extent to which the caller and operator can work together to exchange this information depends on effective communication [e.g., 10, 11-16].

Consequences of difficulties in communication. Language differences between operators and non-native callers can decrease the effectiveness of communication and create uncertainty and confusion, which impede the operator's ability to decide whether emergency dispatch is necessary [16, 18]. In one study of emergency calls in the UK, 482 of 1830 calls (i.e., 26.3%) were problematic because of language difficulties [13]. Language differences can pose serious, possibly life-threatening risks for the patient. In addition, language differences are problematic for the non-native caller, who finds him- or herself unable to express the urgency and the details of the patient's situation. If communication with the operator breaks down, the caller's anxiety increases, which may worsen his or her language abilities [19]. Furthermore, anxiety increases attention to threat-related stimuli [20], and it can create a tendency to interpret ambiguous utterances as threatening [21-22], both of which would affect how the non-native caller interprets the AMK operator's actions and may decrease the caller's trust in the operator. Indeed, AMK operators report that some caller's frustration levels escalate to such an extent that the caller can

direct abuse, accusations, and threats towards the operator. The emergence of open conflict makes it very difficult for the operator and caller to continue to work together. Language difficulties and anxiety therefore pose a serious barrier to the patient's access to necessary medical care; thus, as mentioned previously, this barrier can be life-threatening for the patient. Operators are also vulnerable to the risks language difficulties create. Operators find that when language and cultural differences obstruct their work and impede the triage process, they experience increased uncertainty and a sense of powerlessness [12], which, combined with the high demands of their job and the potential consequences of error, lead to high stress levels [23]. Indeed, operators report that their assignments create a stressful workplace [12, 24]. Stress is reflected in their cortisol levels, which are significantly higher than control subjects [25]. Employees benefit from stress reducing interventions that increase their sense of control [26]. Thus improvements to difficult calls to 113 would increase safety for patients, but would also bring tangible benefits to non-native callers themselves and to AMK operators.

Project organization

This project reflects an ongoing collaboration between researchers and practitioners, which has kept the focus of the research directly relevant to practice [27] and which will facilitate the future implementation of the recommendations [28-29]. Gunnar Farstad (AMK Ullevål) and Arild Aambø (Norwegian Centre for Minority Health Research, NAKMI) initiated this project. Aambø provided the initial approach and perspective that have framed the project throughout. In collaboration with operators at AMK Ullevål, Farstad provided the initial source material. In 2009, a variety of personnel from NAKMI, AMK Ullevål, Nasjonalt kompetansesenter for helsetjenestens kommunikasjonsberedskap (KoKom), and Primærmedisins verksted (PMV) collaborated in the collection of pilot and simulated source material. Thor Indseth (NAKMI) and Jennifer Gerwing (NAKMI) did the theoretical and methodological groundwork, analysed the source material, devised recommendations, conducted pilot-training courses, and wrote this report. Aambø and Janet Bavelas (University of Victoria, Canada) provided guidance throughout the project, and Farstad provided enthusiasm as well as the institutional support and cooperation that were essential for close collaborations with AMK operators. Ingrid Ølberg (an operator from AMK Ullevål) made invaluable contributions throughout, including encouraging the involvement of her colleagues (i.e., other AMK operators), arranging the many details around the collection of simulated source material, and providing ongoing, informal feedback and validity checks to ensure that the recommendations stayed close to AMK operators' assignments and experiences of these calls.

We have provided recommendations based on AMK operators' current best practice. People, in general, know more than they are able to identify, articulate, and explain. In this specific case, AMK operators may have sufficient experience and intuition to be skilled communicators, but they might not be aware of or have identified these skills, which impedes their ability to use those skills intentionally and strategically [30]. Our recommendations should enhance AMK operators' ability to identify, articulate and explain what they do that works (and therefore leads to a successful outcome) as well as what they do that does not work (and therefore leads to poor outcomes with misunderstandings or unnecessary conflict). As operators become more aware of

their own behaviours, they can avoid repeating mistakes and use successful strategies more intentionally and more often. A deeper and more nuanced understanding of their skills will also allow them to share their knowledge and solutions with colleagues and to train new operators more effectively.

Method and theoretical approach

Emergency call literature that specifically proposes recommendations for communicating most effectively with non-native callers has not yet been available, but several position papers and studies point to a need for such research. For example, The Joint Commission International stated that ineffective communication with non-native speakers results in health care that proceeds with errors, poor quality, and risks to patient safety [31]. Researchers in Seattle, Washington, recently reported that operators found communication difficulties with non-native speakers to be stressful, and most operators thought communication challenges adversely affected the medical care these callers received [16]. Other researchers, also in the US, found that language difficulties with callers who had limited proficiency in English were a major cause of pre-hospital delays [18]. Although the organization of systems in the US differs from the Norwegian context and may not be fully generalizable [6], it is reasonable to believe that language differences in calls from non-native speakers are causing challenges for AMK Ullevål and for patient safety in Norway. Research is evidently needed to outline "best practices" for emergency telephone communication with non-native callers.

Another possible source for communication recommendations could come from scientific reports of analyses of emergency telephone calls (i.e., "observational" research), even if these reports did not directly address calls from non-native speakers. However, probably for ethical reasons, observational studies using emergency call data are few [10-11, 13, 15, 32-35], and the purpose of these studies was often to describe linguistic phenomena rather than propose evidence-based practices for effective communication. We found that none of these findings in these papers were readily adaptable to concrete recommendations.

We did find inspiration from an unexpected source. In the 1980's, a group of scientists from NASA conducted several studies on crew communication in aviation disasters using the black boxes recovered from accidents. Their research focused on evaluating whether lack of effective communication could be one of the reasons for the accidents. Somewhat surprisingly, they found that some of the accidents were caused by communication behaviours between pilots and co-pilots that at first glance seemed fairly unproblematic [36]. One could expect to find that communication failures would be due to lack of hearing, or lack of shared knowledge. Instead, they found that everyday speech patterns became problematic when used in the critical aviation context. Specifically, overly mitigated or (i.e., polite or indirect) requests were often misunderstood, so the instruction, direction, or warning in the utterance was not comprehended as such. For example, in one close call, a plane overran the runway by 728 feet because it was

going considerably faster than recommended speed. In later interviews, the pilot was not aware that they were flying too fast. However, the co-pilot reported having warned the pilot in subtle ways. Analysis of the black box recording showed that the co-pilot did indeed make a couple remarks to the pilot, such as "yeah, it looks like you got a tailwind here" [36, p. 379]. Although the co-pilot saw these remarks as suitable warnings, the pilot did not perceive them as such, so he did not take appropriate action. Thus small, seemingly innocuous words and phrases could make the difference between a successful landing, a close call, or a disaster. In the medical emergency calls, we have found similar features, which should encourage operators to take the time to examine calls closely. The findings of the NASA scientists suggest that one should take into account not just the content and process of communication, but also its context, because some conventions that work well in some settings could be disastrous in others.

Our recommendations emerged from an analysis of communication in a selection of medical emergency calls (see "Note on source material" below). The conceptual foundation of analysis was the collaborative view of communication, which characterizes dialogue as a joint activity [37-38], akin to dancing or playing tennis. According to this view, mutual comprehension in conversation is a collaborative activity [37]. Research on native/non-native communication corroborates this approach; for example, interaction plays a key role in increasing the ability for a native speaker to comprehend what the non-native speaker is saying [39]. A wealth of scientific literature about communication has roots in the collaborative approach, and this literature reveals several relevant, key interactive processes, such as the effect of listener behaviours on speaker behaviours [e.g., 40, 41-42] or how participants achieve and display mutual understanding [37, 43-45]. (A selection of specific findings from this body of literature as well as literature about native/non-native communication will precede relevant sections in the recommendations.) In addition to scientific literature, we paid particular attention to the key contextual parameters, which are outlined below.

In summary, our analysis and the recommendations formulated here evolved out of a threefold framework: (1) recordings of emergency calls, (2) scientific literature about fundamental processes of dialogue, and (3) the relevant contextual parameters of these calls.

Note on source material

For this project, we obtained source material from actual calls and simulated calls. For the actual calls, operators from AMK Ullevål flagged 30-40 calls from non-native callers that they felt exemplified the challenges operators experience. Gunnar Farstad selected ten of these calls and replaces all personal data (e.g., names, addresses, and personal numbers) with beeps. Thus we used ten anonymized actual calls to 113 from non-native callers. We also collected 25 simulated calls from non-native speakers to AMK operators. The simulations stayed close to operators' occupational reality. The operators took the calls at a simulation centre (KoKom) that had the same physical equipment and arrangement that the operators were accustomed to. During the calls, the operators used their usual procedures and routines. The operators received calls from a

group of volunteer, non-native speakers from a variety of ethnic backgrounds and with a variety of language abilities. The calls were unscripted and based on scenarios either contributed by Ølberg or by the non-native callers based on their own or other's experiences. A more comprehensive description of the data collection procedures and the calls is in Appendix A. (Note that both the real and simulated calls were collected within the context of an internal quality-assurance project within Oslo University Hospial, Ullevål and thereby did not require permission from the regional research ethics committee.) Indseth and Gerwing used ELAN (EUDICO Linguistic Annotator; http://www.lat-mpi.eu/) to transcribe and annotate the source material.

Communication

The word *communication* derives from the Latin word *communicare*, which means to share and/or to make common. The Latin root fits the medical emergency call context, in which the operator and caller must work together to make accurate and relevant information common knowledge. But useful recommendations need more than a definition of communication, they must be informed by a clear definition of *effective communication.* Although none of the papers about emergency communication that we have reviewed provided such a definition, the Joint Commission International (JCI) contributed the following: "Effective communication is communication that is comprehended by both participants; it is usually bidirectional between participants, and enables both participants to clarify the intended message" [31, p. 360].

Our essential tool for analysis was *microanalysis of communication*, which is the detailed and reliable examination of observable communication sequences as they proceed moment by moment in the dialogue [46]. The time scale of microanalysis is very small, focusing on events that often occur within a one- or two-second interval. This time scale was necessary because of the speed and precision of the participants' actions. Our analysis of communication in these calls fit the JCI definition, and it has a number of features that are best illustrated by a short example from one of the simulated calls. We encourage the reader to read the example aloud:

	Start time	End time	Speaker	Words
1	00:03.1	00:08.7	Caller:	du ee jeg har en jente som er to år
2	00:09.0	00:09.7	Operator:	to år ja
3	00:09.9	00:10.2	Caller:	Ja
4	00:11.3	00:12.5	Operator:	en liten jente ja
5	00:12.9	00:14.5	Caller:	hun er hun er syk
6	00:14.9	00:16.1	Operator:	hun er syk hvordan syk
7	00:17.1	00:19.5	Caller:	hun har så mye varmt
8	00:20.1	00:21.6	Operator:	hun er veldig varm ja
9	00:21.3	00:21.6	Caller:	Ja

We focused on communication at the *behavioural* level, that is, rather than attempting to infer operator and caller motivations or intentions, we focused on what they actually said to each other. In the above example, the transcript shows the operator and caller's words. For analysis, we would also listen to the recording to hear each participant's intonation and pronunciation. We also focused on each utterance in *sequence*. For example, utterance 5 ("hun er hun er syk") serves a function that cannot be understood without the context provided by its relationship to other utterances in the call. First, we would examine this utterance in relation to its context in general: The caller said utterance 5 as part of her description of the patient. Second, we would analyze it in terms of what came before it: Immediately before utterance 5, the operator's responses clearly demonstrated that she had understood the caller's information so far (by saying both "to år ja" and "en liten jente ja"). Thus it was appropriate for the caller to go on to contribute new information about her little girl. Finally, we would consider the listener's immediate response to the utterance: The operator's response here displayed her comprehension of the information the caller's utterance contained ("hun er syk") while also inviting the caller to elaborate ("hvordan syk"). Each utterance also had the potential to influence later sequences in the call. A sequential analysis such as this recognizes the *contingent* relationship between utterances. Each utterance has potential effects, both at the local level (i.e., the next utterance) and at a more temporally distant level (i.e., later in the call).

Contextual parameters

Practice-relevant recommendations must take into account the set of key contextual parameters that impose themselves on the practice setting. We have identified four parameters that are particularly important. (1) These interactions are elicited in and transpire during an emergent, changing, and possibly life-threatening situation. (2) Within that setting, AMK operators have a clearly defined role and assignment. (3) Operators and callers must communicate on the telephone. (4) The callers in this particular setting, whether speaking in Norwegian or in English, must speak in their non-native language. Each of these parameters is outlined in some detail below.

The emergency setting. Emergency calls are a very specific communication setting with features that must be acknowledged both in analysis and in the formulation of recommendations. First, stakes are high. Every call an operator takes could present a life or death situation. Second, time is precious and limited. Communication must therefore be as efficient as possible while maintaining the accuracy of the information. Third, it is imperative that the operator establish sufficient trust with the caller that the caller can rely on the operator's judgement. In the example above, the operator does not yet have sufficient information to ascertain whether the caller's daughter's condition warrants an ambulance. The operator must gather information quickly in order to make this decision.

AMK operators' assignment. Operators must gather and prioritize information according to the Norwegian Medical Index, which provides a systematic guide for questions and instructions. As operators get information, they triage each call, deciding whether it represents a red response (the

immediate dispatch of an ambulance with sirens) or an alternative (e.g., an ambulance without sirens, advice to go to Legevakt, a home visit from a physician). In the example above, the operator's assignment demands that she focus on particular information to help her make a decision. So far she has figured out that the patient is a young girl, and the caller's description suggests that the young girl might have a fever, which is of particular importance for the operator's assignment. Operators must also guide the caller in any instructions to help with the patient's situation, whether an ambulance is necessary or not, and must remain "on the line" with the caller until the ambulance arrives or until the caller is secure about the alternative suggested service. Throughout this process, computers provide operators with information and help the operator to share information with ambulance personnel. Computer tools are a mixed blessing. Although they are a valuable resource, they can also be a source of distraction for the operator. For example, if the operator must talk with a caller in English, he or she is still obligated to type information into the log in Norwegian.

The telephone setting. Communicating on the telephone removes all visible communicative resources that would normally be available in face-to-face conversations. First, facial expressions are unavailable for enhancing or supplementing words. For example, in a face-to-face dialogue, an individual's seemingly agitated tone of voice could be softened if his facial expression showed intense fear, desperation, or anxiety. On the telephone, the listener only hears the agitated tone. Similarly, a puzzled or blank look on a listener's face could provide a cue that key information was not understood. A speaker on the phone cannot see a listener's puzzled expression and, in the absence of verbal cues, might mistakenly assume that the listener has understood. Second, in face-to-face dialogue, speakers can use gestures to point or to supplement their words. Again, these are useless on the phone. Finally, in face-to-face dialogue, participants can see the objects, people, and other features of the space that they share. On the phone, an operator not only cannot see the patient, but also is left uncertain about who the caller is, how many people are there, and what the background noises might mean. In the example above, because they are speaking on the phone, the operator cannot tell how warm the young girl is, and the operator is dependent on the caller's description that she is "mye varmt". It is important to note that the operators' context is equally invisible to the caller, so the caller cannot see when the operator is checking information on the computer or in the Index, or when the operator has to confer with a colleague. The operator's silence in these moments can be inexplicable to the caller.

Non-native callers. Most non-native callers are people who have immigrated to Oslo. As mentioned previously, non-native language abilities vary a great deal. Furthermore, even when language skills are adequate for work and social events, they may create misunderstandings in an emergency situation. When making calls to 113, non-native callers have no other choice but to do so in a language that they do not speak well. Whereas these callers would likely have no difficulty describing the patient's medical situation in their own language, they will have difficulties explaining it clearly and accurately in Norwegian. For example, often callers can only say that the patient is "sick" or "very sick" because they do not have sufficient vocabulary to say much more than that. Consequently, these callers often repeat words again and again; they do not have the flexibility afforded to native speakers, who can use alternative words or different

phrases to convey information that has not been understood. Judging whether they have expressed information correctly and whether the operator has understood so far will be an additional challenge for these callers. Furthermore, understanding the operator's questions and instructions may be difficult, and these callers may find themselves saying "yes" to questions they do not completely understand. In the example above, because the caller has limited Norwegian language skills, the description is not rich and relies on a limited vocabulary; however, she and the operator seem to be accumulating mutual understanding quite effectively.

In addition to language difficulties, knowledge about public institutions takes time to learn. Non-native callers are in a new, unfamiliar country and must function within systems that may work differently than what they are accustomed to. The Norwegian medical system (including when and why one should call 113 and what to expect during the call) is just one of innumerable systems that immigrants must learn. Basic medical knowledge that most Norwegians take for granted (e.g., basic first aid) might also be unfamiliar to immigrants. Therefore operators cannot rely on this shared knowledge to frame instructions. In the example above, it is possible that this caller's knowledge of the medical system is limited. She may not know whether 113 is the appropriate number to call and may have just seen this number on her telephone book with an ambulance next to it. If the operator later must give instructions for how to get the child's fever to lessen, she may be confronted by a caller who is not familiar with the concept of a fever, much less how one should treat it at home. Non-native speakers and operators consequently share little common ground and are facing a challenging situation. The chances for unpredictable misunderstandings, uncertainty, and confusion will be very high.

In summary, within the context of the severe time constraints imposed by the emergent situation, the operator's assignment, and a context that removes visible communication, the operator must establish trust and mutual understanding with the non-native caller. This may seem like a difficult task. However, we have seen that AMK operators routinely do this very effectively. Our recommendations are focused on revealing and explaining the most efficient practices we have seen operators use.

Advice to AMK operators

Introduction

Operator and caller behaviours are intertwined and interdependent. The scientific literature about language use in dialogue demonstrates that it is neither feasible nor sensible to give advice that could apply in every call. In other words, the fundamental, collaborative nature of these dialogues (and indeed of all dialogues) prevents a "one-size-fits-all" set of universally applicable recommendations. However, this literature points to systematic patterns and processes, which we have synthesized and applied to this particular context. Our recommendations show how and why the operator should listen, adjust to each caller, and minimize confusion as each call proceeds.

Following these recommendations should help the operator to establish trust with the caller quickly, to minimize uncertainty, to exchange accurate information with the caller, to give relevant advice that the caller can follow, and to reduce the chance for conflict to emerge. Each operator's ability to use these recommendations in his or her daily work will require that the operator (1) be taught the fundamental processes (e.g., in presentations, seminars, this report), (2) observe and discuss these processes in their own or in colleagues' calls, (3) practice using these processes, including participation in both informal and formal self-evaluation as well as evaluation by peers. (For more detailed suggestions, see the chapter "Advice to the AMK System" in this report.) Note that all of the recommendations in this report are based on effective operator behaviours that we have observed in the calls. By explicating the behaviours clearly and by giving examples from the calls, we will help operators to participate in the calls with more awareness and intention.

A note about examples. Examples throughout this chapter illustrate the recommendations. The examples are excerpts from the actual or simulated calls, and they contain no personal data. Names and addresses are either fictional or replaced with [XXX]. A brief introduction precedes each example; introductions provide context for understanding the example, and they direct the reader to its relevant features. Each example is in the form of a table, with one utterance per line, which are numbered to ease reference in the text. Note that all examples start with number 1, even if utterance 1 is not the first utterance in the call. Two columns show each utterance's start and end time, timed from the beginning of the call (at 00:00.0). So, for example, an utterance that

started at 00:45.0 took place 45 seconds into the call. The fourth column shows who was speaking (OP = Operator, CA = Caller). We have kept transcription conventions to a minimum, indicating short pauses with punctuation . , longer pauses with a line _ , and interruptions with a vertical line |. We have underlined utterances as a guide to suggest where the reader should pay particular attention. Finally, an explanation of each example follows the example itself. We encourage the reader to take the time to read each example carefully, perhaps even reading it aloud, to see for him- or her-self how the example fits the concept it is illustrating. An inventory of the sources of all the examples is in Appendix B.

The advice in this section is based, in part, upon a basic understanding of communication as described in Jan Svennevig's book *Språklig samhandling: Innføring i kommunikasjonsteori og diskursanalyse* [47] and Herb Clark's book, *Using language* [37]. In the following sections, we focus on how and why operators listen to callers, establish mutual understanding with callers, adjust to each caller, and adopt transparency with callers about what is happening during the call. We then examine conflict, focusing specifically on the role of communication in remediating or exacerbating conflict.

Listening to the caller

As mentioned in the introduction, the operator needs information from the caller. Hearing and understanding the caller's contributions requires that the operator listen to the caller. Listening is not a passive activity, and how one listens influences the speaker [see reviews in 40, 48, 49]. Listening also requires careful attention to what the caller is saying, particularly when callers have an unfamiliar accent or when they are having difficulties expressing themselves in Norwegian. The following section outlines two key points about listening. First, non-native speakers can make errors in vocabulary and grammar that may be difficult for the operator to recognize as errors [e.g., 50]. Second, even as the "listener", the operator can take an active role in helping the caller make his or her utterances more comprehensible [e.g., 39, 51, 52].

One impediment to the operator's active role as listener is if the operator interrupts the caller. While interrupting, the operator cannot be listening. Interrupting signals that the operator is focused on what he or she is planning to say; it also prevents the operator from hearing the caller. Consequently, when interrupting, the operator misses what the caller is saying not just at the actual point of interruption, but also immediately preceding it. Several examples in the source material show that callers' initial statements leave some of the most critical information for the end of the utterance, which would be lost if the operator had interrupted the caller.

Detecting non-native speaker language errors

One of the most basic assumptions in normal conversation is that what is being said is what was intended [53]. This assumption is often violated in conversations with non-native speakers, when

callers might say something that is different from what they meant to say. These errors are not immediately obvious. For the operator, this presents an extremely challenging and problematic scenario. When the caller uses the wrong word or makes errors in grammar, the operator is confronted with information that appears irrational, illogical, and often discrepant with other information in the call.

Thus if the information that the caller provides makes no or little sense, or if new information is incongruent within what the operator has understood so far, the operator should keep in mind that the caller might be having difficulties explaining in Norwegian what has happened. It is best to start with this explanation, assuming rationality on the part of the caller. Awareness that language difficulties can take this form allows operators to detect and repair errors before they have become full blown misunderstandings.

The most obvious *vocabulary errors* occur when the caller says a word that does not exist in Norwegian.

Listening example 1: Use of word that does not exist

The caller described that her friend was pregnant and in pain. She used the word "viver", which does not exist in Norwegian.

1	00:04.2	00:12.0	CA	og venninen min og såå hun har veldig vondt . og hun er vei gravid . og hun har viver
2	00:12.5	00:13.1	OP	hun har veer
3	00:13.3	00:13.8	CA	Yes

The operator skilfully used the context and the similarity in sound to guess correctly that she meant to say "veer."

However, vocabulary errors can be less detectable when the caller says an actual Norwegian word that means something different from what the caller intended to say (e.g., "blue" instead of "blood", or "knife" instead of "knee"). These words can be related in how they sound (e.g., start and end with same sounds) or in the general category of what they mean (e.g., saying "arm" instead of "leg", or "two" instead of "three"). If the operator hears a word that is unfamiliar or does not make sense, the operator should consider alternative words that would make sense in that context (such as guessing that the caller meant to say "veer" when the caller said "viver") or make it clear to the caller that the operator has not understood that word.

Non-native speakers can also have difficulties with *grammar*. Grammar is the part of language that expresses how things relate to each other in time ("he is unconscious" vs. "he was unconscious"), in space (e.g., "he is on the bed" vs. "he is beside the bed"), and in who did what

to whom (e.g., "she made him cry" vs. "he made her cry"). Different languages have different grammar structures and thus different ways of expressing these relationships. A non-native speaker can develop a good vocabulary but still struggle with the correct grammar. For example, they might use the vocabulary of their new language within the structure of their native language, which alters their meaning considerably. These errors can be particularly problematic in emergency calls, and in our source material, grammar errors are frequent.

Some grammar errors are obviously wrong (e.g., "han er gravid"). But others are difficult to detect, particularly when the utterance construction is correct from a technical standpoint but is not what the caller meant to say. The caller will likely not realize he or she has made an error, and these errors could easily slip by the operator unnoticed. Grammar errors create confusion and only become apparent when subsequent information does not fit.

Listening example 2: Use of wrong grammar

The caller was a nurse's aide working at a nursing home. She had called 113 to ask for an ambulance for a woman who had passed out. From the analysis of the whole call, it is apparent that the patient had been having problems breathing before the nurse's aide made the call, but at the time of the call, the patient was breathing again.

1	00:45.8	00:49.3	CA	ikke noe kontakt nå, hun puster så vidt nå da er det ikke noe pust ingen ting
2	00:49.6	00:50.3	OP	ikke noe pust
3	00:50.5	00:53.5	CA	nei men det begynte å komme litt svakt nå men får ikke noe kontakt på svar
4	00:53.3	00:55.7	OP	Nei . men kan du lægg ho ned på gålve

The caller made a number of grammar errors early in her description that the operator did not detect as errors. In utterance 1, the caller used "er" instead of "var", and because she said this quickly in a sentence that was inconsistent about what happened when, the operator mistakenly believed that the patient was currently unable to breathe. In utterance 3, the caller indicated quite clearly that the patient was indeed breathing, but the operator was focused on giving directions for how to help the patient breathe and did not hear the caller and it seems that she did not hear this utterance. This fundamental misunderstanding was never sorted out in the call. The caller could not figure out why the operator was giving instructions for CPR, and the operator was alarmed that the caller was not following her instructions. The caller also explained that a physician was present, which added further confusion. The operator was left believing that the patient was not breathing and was not receiving CPR, which must have been shocking given that a nurse's aide and a doctor were present. This example illustrates why operators should consider whether a caller's grammar errors may explain apparently inexplicable circumstances. Although this confusion did not affect the care for this particular patient, it is not difficult to imagine that grammar could create confusion the other way around and could lead to a critical error.

When the caller is hard to understand

When operators hear a caller's description of what has happened, they must be selective about what information they prioritize by following up right away (e.g., with questions). Because operators probably understand all of the information a native caller says, they select, prioritize, and follow up on the most critically relevant information. In contrast, the information in non-native caller descriptions might not be easy to understand, and our analysis shows that operators sometimes select information from these descriptions based what the operator has understood, while ignoring the incomprehensible words. That is, whereas operators tend to filter native caller descriptions based on critically relevant information, some may filter non-native descriptions based on comprehensibility. Unfortunately, information in the incomprehensible words might be the most critical. The potential for error is far greater if the caller believes that the operator has understood the whole description. Thus operators should tell callers when they have had problems understanding. Some methods of signalling are outlined below.

Because incomprehensible parts of utterances might contain important information, the operator needs to help the caller make them comprehensible. A simple strategy is to ask the caller to repeat, which leaves it open as to whether the problem is one of hearing or understanding. Svennevig [54] showed that when native listeners indicated that they had a problem with what the non-native speaker said, these listeners most often construed the problem as one of hearing, rather than one of understanding. Asking for a repetition has several direct benefits. First, simply hearing the utterance again might allow the operator to comprehend it. Second, the caller might take the opportunity to rephrase the information (e.g., making it more understandable, prioritizing the most critical information). Third, this process itself signals that the operator had problems understanding, and it will help the caller to identify which information the operator did or did not understand.

Listening example 3: Wrong pronunciation

Previous to the following excerpt, the caller had followed the operator's instructions to move an unconscious man from his bed to the floor. In utterance 1 below, she asked the operator a question. The caller pronounced two words incorrectly and used grammar that made the question difficult to understand. The operator used three strategies for getting the caller to repeat the question, each of which are explained below the example.

1	06:02.0	06:04.8	CA	Kan ligge i butte i hude?
2	06:05.1	06:06.0	OP	Om han kan
3	06:06.3	06:09.1	CA	butte heri nede i hude
4	06:09.7	06:11.0	OP	butte i hode?
5	06:11.0	06:11.6	CA	Ja
6	06:11.7	06:12.6	OP	hva betyr det?

In utterance 2, the operator rephrased the start of the caller's question and left it unfinished, which encouraged the caller to repeat the end of the question. In utterance 4, the operator repeated the problematic words using a rising intonation to convey that she had not yet understood. The caller seemed to interpret utterance 4 as confirmation of understanding rather than a request for clarification, and she answered "ja". In utterance 6, the operator used a more direct request for clarification. Note that of these three strategies, repeating the problematic words with a rising intonation was the least successful. Later in the call, it became clear that the caller was asking whether she could put a pillow under the patient's head.

Listening example 4: Strong accent

The caller had a strong accent that the operator needed some time to understand. In utterance 1, which started 11 seconds into the call, the caller described his location. The operator did not understand and asked the caller to repeat the information.

1	00:11.8	00:22.9	CA	yeah I'm calling from Oslo... um.. I'm at the ah Oslo Jernbantorget you know? The new place called Operahuset?
2	00:23.6	00:26.0	OP	Um tell me that once again please
3	00:26.0	00:28.1	CA	Ah I'm calling from Oslo
4	00:28.1	00:28.5	OP	Yes
5	00:28.7	00:30.5	CA	And I'm at Operahuset
6	00:30.5	00:32.0	OP	Operahuset, yes
7	00:31.8	00:32.5	CA	yes, yes
8	00:32.5	00:32.9	OP	Med mer
9	00:32.7	00:36.5	CA	I need an ambulance my friend is is seriously injured

By asking for the repetition, the operator signaled that he did not understand. Note that the caller did not simply repeat his utterance word for word. Instead, he simplified his original utterance and divided it into two separate information units (utterances 3 and 5). The operator was able to understand these utterances.

Listening example 5: Mixing languages

Utterance 1 in the following example occurs 3 seconds into the call, and it is the caller's first description of why she is calling. The caller used a combination of Norwegian and English, and she used a word that the operator did not understand. Note how persistent the operator was in working with the caller to fix the incomprehensible word.

1	00:03.5	00:12.4	CA	ja go in viein og ah- I see a man ah- um <u>pecke chest</u>
2	00:12.7	00:13.8	OP	I, I'm sorry
3	00:14.1	00:18.0	CA	I see a man <u>peckechest</u>, ja go a veien
4	00:18.1	00:20.6	OP	yeah you, you were walking along the road, yes
5	00:20.1	00:20.6	CA	Yeah

6	00:20.7	00:21.1	OP	and then-
7	00:20.8	00:22.4	CA	and a man peckechest
8	00:24.5	00:25.8	OP	there is a man in the road?
9	00:25.9	00:27.6	CA	yeah, falling eh lying down
10	00:27.8	00:28.6	OP	he's lying down
11	00:28.7	00:29.1	CA	Yeah
12	00:29.0	00:31.1	OP	is the man awake, can you talk to him?
13	00:31.3	00:32.8	CA	ah no, he cannot talk, he-
14	00:33.1	00:34.1	OP	OK, but-
15	00:33.9	00:34.8	CA	Men ikke kan nei
16	00:35.0	00:36.8	OP	but, but can, can he look at you?
17	00:37.0	00:40.1	CA	ah yeah, peckechest han bare peckechest
18	00:40.9	00:42.1	OP	I'm sorry I do not get that
19	00:42.2	00:43.8	CA	yeah,
20	00:42.8	00:43.9	OP	can, can you try to-
21	00:44.1	00:46.3	CA	han peckechest pointing chest
22	00:46.7	00:47.9	OP	he's pointing at his chest
23	00:48.0	00:48.4	CA	Yeah

The operator used several strategies for indicating that she did not understand the word. In utterance 2, she said, “I’m sorry”, which encouraged the caller to repeat her first utterance. In utterance 4, the operator repeated the part of the caller’s utterance that she had understood, and used intonation in utterance 6 to indicate that the caller should finish the sentence, which the caller did. For 15 seconds, the caller and operator cover other information, but then the caller repeated the problematic word again in utterance 17, which strongly indicated that she believed the information to be particularly important. At this point, the operator explicitly said that she did not understand, giving the caller another opportunity to rephrase or explain the word. In utterance 21, the caller finally found the English word she was seeking (“pointing” instead of “pekke”). The operator indicated her understanding by putting the English word into a full sentence. The operator’s persistence paid off; the information was indeed critical for the patient’s condition.

Listening example 6: Making clear what is not understood

We have included the following example to illustrate why it is important for operators to signal that they have not understood something. In this example, the caller had a very strong accent and his words were difficult to understand. Utterances 1-4 are the first few seconds in the call, when the caller reported that his wife was having a lot of problems breathing after an operation. Two and half minutes later, after the operator gathered information and various things happened (listed below), the issue of breathing re-emerged (see utterances 5-7).

1	00:07.5	00:10.6	CA	Min kone har nettopp blitt operert på [x] sykehus og har kommet hjem
2	00:11.0	00:11.2	OP	Mm
3	00:11.2	00:13.3	CA	Og hun har store problemer nå med å puste
4	00:13.6	00:15.3	OP	OK, hvilken adresse sa du?
	00:15.3	02:43.4		• Address is understood • Operator asks follow up questions focused on the operation • Caller leaves the phone • There are screams in the background • A female caller comes on the line • The male caller returns after being away for one minute • the operator asks whether the wife is awake
5	02:43.4	02:48.7	CA	Hun er våken og hun mister pusten rett som det er og gisper etter luft og er helt desperat
6	02:49.2	02:50.8	OP	Helt desperat fordi at
7	02:51.3	02:59.6	CA	Fordi hun ikke kan puste og jeg prøver å gi henne munn mot munn, ee eee, åndedrett, og det går sånn ikke godt nok

In utterance 4, the operator gave an indication that she had understood what the caller said ("OK"), then she asked her next question ("hvilken adresse sa du"). However, it later appeared that she could not have understood about the breathing problems, because she spent the next two and a half minutes following up other, less critical issues and because her question in utterance 6 suggests a lack of understanding about the breathing problems.

Summary of recommendations on listening

Listening is an active process, and operators who listen to callers carefully obtain accurate, relevant information very early in the call. Careful listening is especially important when the caller speaks poor Norwegian.

1. If possible, operators should avoid interrupting the caller.
2. For non-native speakers, language difficulties can create a mismatch between what the caller intended to say and the caller's actual utterance.
3. If information the caller contributes makes little sense or is discrepant with other information, the caller may be making language errors. Operators who are aware of possible language errors can detect and correct them to repair misunderstandings.
    a. A caller might use a Norwegian word incorrectly and might not realize the error.
    b. Even if the caller's vocabulary is fairly strong, he or she might use incorrect grammar, which can severely affect meaning in several ways: (1) time (when something took place), (2) relationship (what happened to whom), or (3) place (where did something happen in relation to what).

4. If a caller's utterance contains both understandable and not understandable information, operators should resist elaborating on what was understood while ignoring what was not. Because the most critical, relevant information might have been in the less comprehensible part of the utterance, spending time asking questions about less critical and less relevant information wastes time and erodes the caller's trust in the operator. In addition, focusing only on what was immediately understood can send the call down the wrong track; that is, time will be spent on information that might have been less important and less relevant to the emergent situation.

5. Operators should work with the caller to make incomprehensible utterances more comprehensible. Operators should ask callers to repeat incomprehensible utterances, which (1) informs the caller that the operator did not understand, (2) gives the caller the opportunity to reformulate the utterance so that it is more understandable, and (3) gives the operator a chance to listen again.

Creating and displaying mutual understanding: grounding

Even when both the caller and the operator are native speakers, the meaning of what each of them says is not inherent in the words in their utterances [37, 55]. Utterance meaning is thus negotiated until both parties agree that they have understood each other well enough for current purposes [37]. Far from being an onerous process, agreeing on utterance meaning and accumulating mutual understanding is something all speakers and listeners do throughout everyday conversations, even though they might not be consciously aware of the details underlying the actual process. Mutual understanding is accomplished through the process of *grounding* [37, 44-45, 56]. Grounding occurs in a three-step sequence: (1) the speaker presents some information, (2) the listener indicates what he or she has understood, and (3) the speaker evaluates whether the listener's understanding is accurate. Attention to this process is particularly important when there is less common ground, both in language and in system knowledge [50-51]. According to Varonis and Gass, the "most conversationally 'dangerous' situation arises when interlocutors lack shared background, linguistic system, and specific beliefs, yet do not seek to negotiate meaning" [50, p. 341]. In calls to 113, this 'danger' takes a very tangible form. To address the lack of common ground in native/non-native interactions, the participants must notice and acknowledge that a misunderstanding has occurred and subsequently repair it [50]. Our recommendations focus mainly on two types of grounding: explicit and implicit.

Grounding explicitly

When listeners indicate what they have understood, they can do so by being clear and specific about what they have understood; for example they can repeat or paraphrase what the speaker had said. Grounding can be considered to be *explicit* when the listener responds in a way that specifies what he or she has understood. When the listener grounds explicitly by displaying what he or she has understood, the speaker has the opportunity to ascertain whether that understanding is correct.

Grounding example 1: grounding explicitly by repeating information

The caller and the operator grounded explicitly on the caller's address using three grounding sequences. Notice how the operator clearly displays what she has understood.

1	01:22.4	01:25.3	OP	nei ee kan du hvor bor du hen
2	01:26.1	01:30.6	CA	ee jeg bor i Ålesundgate ee... Å
3	01:30.8	01:32.1	OP	hva sa du Ålesundgata
4	01:32.5	01:33.4	CA	Ålesundgata
5	01:33.9	01:34.9	OP	ja nummer
6	01:35.0	01:35.2	CA	Seks
7	01:35.8	01:36.5	OP	nummer seks
8	01:36.8	01:37.1	CA	Ja
9	01:37.2	01:38.5	OP	hvilken etasje bor du i
10	01:39.2	01:40.8	CA	etasje det er fjerde
11	01:41.3	01:43.5	OP	fjerde etasje hva står det på døra di
12	01:42.1	01:42.3	CA	Ja

The first grounding sequence is in utterances 2, 3, and 4. The caller presented the street name where she was located; the operator specified what she understood by repeating the street name as part of her question in utterance 3; the caller then confirmed that the operator's understanding was correct by repeating the street name. This sequence ensured that they had established mutual understanding about the street name. The other grounding sequences begin in utterance 6 (grounding on the address number) and 10 (grounding on the floor number). After these three sequences, both the caller and the operator could be quite sure that they had established mutual understanding about the caller's location, because the street name, the number, and the floor had been grounded explicitly.

Grounding example 2: grounding explicitly by paraphrasing information

Preceding the next excerpt, the operator and caller had decided, after much confusion about the patient's condition, that the best alternative for the patient was to have a doctor make a home visit (instead of ambulance transport). The caller said it would be as difficult for him to have to start all over explaining the situation to a doctor on the phone as it had been to explain it to the AMK operator. He asked whether the operator could call the doctor for him. In the example below, they ground explicitly on this plan.

1	09:26.3	09:29.7	OP	OK then I will try to explain to them what you told me, OK?
2	09:30.5	09:32.2	CA	Not I explain, you explain.
3	09:32.2	09:39.0	OP	Yes I will explain but shall we hang up and I will tell them that the doctor will call you, call you at home?

In utterance 1, the operator contributed the information that she will explain the situation to the doctor. In utterance 2, the caller indicated his understanding explicitly by rephrasing it. This gave the operator the opportunity to confirm that his understanding was correct, which she did by saying "yes" and again rephrasing the information before elaborating on the process by which

this plan would proceed. Because of this sequence, the caller and the operator could be quite sure that they had mutual understanding about how the caller would access the services he needed.

Grounding example 3: grounding explicitly by repeating and paraphrasing information

The caller was the mother of a sick child. The operator grounded explicitly on the important information before moving to her follow-up question. In the excerpt, the contributions of information from the caller are underlined; note how the operator's responses are explicit.

1	00:03.1	00:08.7	CA	du ee jeg har en jente som er to år
2	00:09.0	00:09.7	OP	to år ja
3	00:09.9	00:10.2	CA	Ja
4	00:11.3	00:12.5	OP	en liten jente ja
5	00:12.9	00:14.5	CA	hun er hun er syk
6	00:14.9	00:16.1	OP	hun er syk. Hvordan syk?
7	00:17.1	00:19.5	CA	hun har så mye varmt
8	00:20.1	00:21.6	OP	hun er veldig varm ja
9	00:21.3	00:21.6	CA	Ja

In utterance 1, the mother contributed three pieces of information: the patient is her child ("jeg har"), the patient is a girl ("en jente") and she is two years old (to år). In utterance 2 and 4, the operator grounded explicitly on the most important information: the patient's age and gender, and the caller agreed that this understanding was correct. Then, in utterance 5, the caller contributed the information that her daughter is sick. In utterance 6, the operator grounded explicitly on that general information, and then she asked a follow-up question, seeking more specific information ("hvordan syk"). In response to this question, the caller contributed more specific information by stating that her daughter was very warm. Again, the operator grounded explicitly on that information, this time by rephrasing the statement with correct grammar "hun er veldig varm".

The first three examples above illustrate grounding sequences that are very tight, occurring over three consecutive utterances. Grounding, however, does not always occur in tidy three-step sequences; sometimes it takes a few extra utterances for the speaker and listener to explicitly ensure that they have achieved mutual understanding and to repair possible misunderstandings.

Grounding example 4: requesting confirmation of perceived understanding

The caller had a strong accent that made it very difficult for the operator to understand him. Note how the operator checked whether his understanding was correct, taking the time to ground explicitly on an important aspect of the patient's condition.

1	00:38.0	00:46.7	CA	Yeah, we, we were just taking a walk on the operahuset and because it's cold he, he slipped and then twisted the ankle
2	00:47.0	00:49.3	OP	OK his ankle is ah hurt
3	00:49.2	00:51.9	CA	he's hurt it's swelling, it's swelling, it's swelling
4	00:51.7	00:52.4	OP	OK
5	00:52.5	00:53.0	CA	it's swelling
6	00:53.1	00:56.7	OP	yeah are, are you telling me that it's the ankle or his head?
7	00:57.5	00:58.3	CA	his ankle
8	00:58.3	00:59.4	OP	ankle OK

The caller began by contributing information that his friend twisted his ankle. The operator checked that he had correctly understood that it was the ankle that was injured (utterance 2), but the caller's confirmation of this understanding was ambiguous: in utterance 3, the caller said that the patient was hurt, and that something ('it") was swelling. The operator could not be sure that he had understood correctly, and he requested a confirmation from the caller whether the injury was to the patient's ankle, not to his head (utterance 6). In utterance 7, the caller confirmed that the ankle was injured.

The four previous examples illustrated ideal grounding sequences in emergency calls: Explicit grounding gives operators and callers the opportunity to ensure that their understanding is correct. Explicit grounding is an excellent misunderstanding detector. Misunderstandings must be detected before they can be repaired and clarified, and then understanding can be confirmed.

Grounding implicitly

Grounding is not always explicit; it can also be *implicit* when listeners respond to information with responses that do not specify what they have understood (e.g., "mm," "OK," "ja," "jeg skjønner"). These responses are often referred to as *backchannel responses* [57-59]. They indicate that the speaker is free to continue speaking. Implicit grounding is ubiquitous in everyday conversations, but it could be problematic in the emergency call setting because when grounding is implicit, mutual understanding can only be assumed. Research shows that backchannel responses have different functions in different languages: in conversations between people with the same cultural background, backchannel responses work positively, while they create confusion and misunderstandings in communication between people with different cultural background [60]. Whereas explicit grounding sequences between native and non-native interlocutors can lead to enhanced listener recall of information, when the grounding process is implicit, listener recall is poorer [60]. Thus minimal responses from a non-native caller may be a misleading sign of understanding. Misunderstandings remain undetected, and information in the dialogue can continue to accumulate, perhaps on fundamental misunderstandings, with possible severe consequences.

To illustrate the difference between explicit and implicit grounding, we have created a hypothetical example, altering the operator's responses from one of the previous examples. To make the contrast clear, we have presented an example from an actual call (which contained explicit grounding) next to the hypothetical example (where the caller presents the same information, but the operator grounds implicitly). We invite the reader to read through the implicit grounding illustration and consider whether the caller would feel secure that the operator had understood her address.

EXPLICIT GROUNDING		IMPLICIT GROUNDING	
OP	nei ee kan du hvor bor du hen	OP	nei ee kan du hvor bor du hen
CA	ee jeg bor i Ålesundgate ee... Å	CA	ee jeg bor i Ålesundgate ee... Å
OP	hva sa du Ålesundgata		
CA	Ålesundgata		
OP	ja nummer	OP	Mm. Ja nummer-
CA	Seks	CA	Seks
OP	nummer seks		
CA	Ja		
OP	hvilken etasje bor du i	OP	OK. Hvilken etasje bor du i
CA	etasje det er fjerde	CA	etasje det er fjerde
OP	fjerde etasje hva står det på døra di	OP	Mm. Hva skjer?
CA	Ja		

From the caller's point of view, if the address had been grounded implicitly, she would not be sure that the operator had heard and understood the information correctly. This would create uncertainty and anxiety for the caller. From the operator's point of view, the address may or may not be correct because implicit grounding provides no opportunities for detecting and correcting misunderstandings. Note that we have not come across a call where the operator did not ground explicitly on the address; this is something the operators do very well. On the other hand, operators do ground implicitly in several other situations, and it would be advisable to ground explicitly instead.

Non-native callers, when responding to information from the operators, often ground implicitly by just saying "ja" or "OK". These responses do not display what the caller has understood. Operators should be aware that such grounding is risky because it does not allow the operator to evaluate whether the caller has understood.

Grounding example 5: Caller grounding implicitly

The operator presented information in the form of an instruction: the caller should try to lay the patient on his side. Notice the difference between the caller's responses in utterance 2 and 4.

1	01:25.9	01:30.5	OP	kan du prøve å legge han på siden og se om det hjelper litt
2	01:31.3	01:31.7	CA	OK
3	01:31.9	01:32.2	OP	Ja
4	01:32.2	01:33.4	CA	hvilken side da

In utterance 2, the caller gave a backchannel response, leaving the grounding sequence implicit. At that point, the operator could not be sure that the caller had understood her instruction. Then in utterance 4, the caller, by asking a question, responded in a way that specified what she had understood. The operator could now be sure that the caller understood.

When confronted by a caller's backchannel responses, the AMK operator should be aware that the caller might not be understanding information or instructions. In these cases, the operator can try to elicit more explicit grounding from the caller, as the operator does in the next example.

Grounding example 6: Eliciting explicit grounding from caller

Prior to this, more extended example, the caller had said that her neighbour was unconscious and lying in the courtyard of her apartment. In the excerpt, the operator asked the caller to go to the neighbour and pinch him, to see whether he would react to pain. Many of the caller's responses to information that the operator contributed are underlined. Note which ones contribute to implicit or explicit grounding, and notice how the operator elicited more specific responses from the caller.

1	02:49.8	02:52.5	OP	gå du må gå bort til nabo
2	02:51.6	02:53.2	CA	Ja, ja
3	02:53.5	02:59.3	OP	og så må du klype og sna.. klype du må gi smerte
4	02:56.2	03:00.8	CA	Ja, e e [said with an uncertain tone]
5	03:00.8	03:01.7	OP	gi smerte på arm
6	03:02.1	03:02.3	CA	Ja [said with an uncertain tone]
7	03:02.6	03:04.3	OP	sånn at han reagerer
8	03:05.5	03:06.6	CA	reagerer hva be...
9	03:06.4	03:09.6	OP	reagerer reaksjon . reaksjon på smerte
10	03:10.3	03:13.0	CA	mmm jeg vet ikke hva det er
11	03:12.4	03:13.7	OP	Nei . Eee
12	03:13.7	03:14.4	CA	hva er det
13	03:14.6	03:18.2	OP	ee kan du du er nå ved din nabo ja
14	03:18.5	03:19.0	CA	Ja
15	03:18.8	03:23.7	OP	Ja . ee snakk til ham og se om han svarer deg
16	03:25.0	03:26.0	CA	ee snakk til ee
17	03:25.7	03:26.5	OP	si halo . si halo
18	03:27.2	03:30.6	CA	ja ja ja . ja ja jeg skjønner det
19	03:29.5	03:30.6	OP	si halo til nabo

20	03:30.8	03:32.5	CA	ja halo halo
21	03:32.9	03:33.3	OP	Ja
22	03:33.9	03:38.5	CA	mannen han ikke ikke gjøre ingen ting ikke svare
23	03:37.9	03:39.7	OP	ikk.. ikke reaksjon
24	03:39.9	03:40.3	CA	Neeei
25	03:40.3	03:41.6	OP	ikke reaksjon nei
26	03:41.7	03:42.3	CA	ikke svar
27	03:42.5	03:42.8	OP	Nei

The caller gave only backchannel responses in utterances 2, 4, and 6, which did not display whether she had understood the information that the operator had presented. Furthermore, the caller's intonation in utterances 4 and 6 displayed some hesitancy and uncertainty. The operator could not know whether the caller could carry out his instructions, and her uncertain backchannels suggested that she was not understanding. In utterance 10, the caller clearly stated that she did not understand the instruction. The operator then tried a different, very sensible approach. In utterance 15, he suggested that the caller go talk to the neighbour and check whether he was able to answer her. Notice that whereas the words "klype" and "smerte" might be unfamiliar to the non-native caller, the word "snakk" would likely be quite familiar. The caller specified her understanding of this new instruction in utterances 16, 18, and 20, making the grounding sequences explicit. At this point, the operator could be more certain that the caller could carry out the instructions. The last few utterances (22-26) suggest that the caller did so.

Although grounding explicitly can appear to take some time, it can still be considered to be time efficient for the following reasons. First, information accumulates throughout the call (i.e., later information builds on earlier information). Thus misunderstandings early in the call can send the call in the "wrong direction", leading to the operator's misinterpretation of later information and eventually a great deal of uncertainty and confusion. Second, if an early, undetected misunderstanding leads to later confusion, the operator must try to figure out where the original misunderstanding occurred, repair it, and then begin to accumulate new information to fit it into the new understanding. Third, this process does more than take time, it also occurs at the expense of accumulating uncertainty and confusion, and an erosion of trust between the operator and caller. Therefore, although grounding explicitly can cost some time at the moment, the benefits are the exchange of more accurate information, less confusion, and more trust with the caller, all of which could save considerable time in the call as a whole.

False grounding

We wish to make one final point about grounding. Our analysis revealed a number of instances of *false* grounding, in which the operator indicated understanding (e.g., by saying "I understand") when it was quite certain that he or she could not have understood. Giving a false signal of understanding creates an erroneous sense of security in the call, and the caller will believe that mutual understanding has occurred when it has not.

Grounding example 7: False grounding

The caller had very limited Norwegian skills and a strong accent that made him very difficult to understand. He contributed information that the operator could not have understood.

1	02:48.1	03:02.4	CA	hude også alt de tingene æ vet ikkje æ er det han har ikkje pust også lenge lenge eee vanlig kan du sp... eee neste han kommer jeg har ikkje snakke mi jeg har ikke snakket med (ru?) med han
2	03:03.6	03:06.9	OP	nei jeg forstår men du har han der han er sammen med deg nå

The caller's utterance in this exchange was quite incomprehensible, yet the operator responded by saying that she understands ("jeg forstår"). This signal of understanding was likely meant to indicate that she understood that the caller was worried and therefore might have been a signal of empathy (the operator's tone was indeed very kind and compassionate). However, if the caller took the words to mean that the operator had understood the information that he had presented, his belief about their level of mutual understanding would be false.

If an operator wishes to display empathy with the caller, he or she should be specific about what has been understood (e.g., "I understand that you are very worried about your child"). This strategy can demonstrate compassion and sympathy while minimizing the possibility of creating false grounding.

Summary of recommendations on grounding

In emergency communication, simply assuming that mutual understanding is correct can have critical consequences. For the caller and operator to achieve mutual understanding of accurate information, each must display what he or she has understood. Participating in such explicit grounding allows both operator and caller to detect and correct misunderstandings.

1. Communication between native and non-native speakers is more prone to misunderstandings. Operators must therefore invest more time and effort to create and secure mutual understanding.
2. Operators should always ground explicitly on all information that is important or at least potentially important.
3. Backchannel responses to information (e.g., "m-hm", "OK") do not display what has been understood.
    a. During calls from non-native speakers, operators should limit the use of backchannel responses, and should use explicit grounding instead.

b. Operators should not take a backchannel response from the caller as a clear indication of understanding. The operators can respond to the caller's backchannels with follow-up questions that seek a clear response from the caller.

4. General claims of understanding (e.g., "I understand") are ambiguous and unreliable, whether they come from the operator or the caller.

   a. To avoid ambiguity, the phrase "I understand" should always be completed with what the operator has understood (e.g., "I understand *that you are frightened*").

   b. Operators should be aware that callers might not understand even if claiming that they do. If the caller's understanding of the information is critical, operators can respond to claims of understanding with follow-up questions to encourage the caller to display more explicitly what he or she has understood.

Adjusting according to feedback

Operators are accustomed to adjusting to a variety of callers. For example, they would adjust their words, questions, and sentence complexity according to whether they were talking to a child, a person who is hard of hearing, or a medical professional. These adjustments obviously cannot be made in advance of the call: they are made according to feedback the operator receives from the caller. Adjustments are not made only once at the beginning of each call, operators must adjust continually throughout each call in response to the caller's feedback. Whereas some topics may be familiar to the caller and allow for faster speech, other topics may be less familiar to the caller, and the operator must speak more slowly and adjust vocabulary accordingly.

Adjusting example 1: General introduction

The caller and operator had achieved mutual understanding that the caller's daughter had a fever. In this example, the operator was instructing the caller and wanted the caller to take some of the child's clothing off to cool her down. Notice how the caller did not understand the original instruction and how the operator skilfully adjusted by giving easier and more concrete instructions.

1	01:50.6	01:56.9	OP	kan du kle av jenta di litt _ Kle av henne klærne_
2	01:58.5	01:59.5	CA	jeg vet ikke hva
3	01:59.5	02:00.6	OP	Ta av klærne_
4	02:01.5	02:01.9	CA	Ja
5	02:02.3	02:05.1	OP	du skal få hjelp men du må kle av henne_
6	02:07.0	02:09.4	CA	hva e hva det betyr a
7	02:09.6	02:11.8	OP	Ta . av . klærne_
8	02:12.7	02:13.0	CA	m hm_
9	02:14.4	02:15.7	OP	sånn at hun blir kald
10	02:16.6	02:17.0	CA	M hm_ _

11	02:18.9	02:19.5	OP	kan du det
12	02:19.4	02:21.0	CA	ee ja skal hun være ut|
13	02:21.3	02:22.2	OP	uten klær
14	02:22.7	02:23.0	CA	Åja
15	02:23.3	02:24.1	OP	bare bleie
16	02:24.4	02:24.7	CA	m hm
17	02:25.2	02:25.9	OP	kan du gjøre det
18	02:26.0	02:27.3	CA	ja det kan jeg gjøre
19	02:27.1	02:29.4	OP	Mm _ gjør det nå
20	02:29.9	02:30.0	CA	Ja

At first when the caller did not understand, the operator tried simplifying and shortening the instruction (utterance 3) and articulating it more clearly (utterance 7). In utterance 9, she tried a different concept for the same instruction. In utterance 12 and 14, it seemed like the caller was beginning to understand. The instruction was important, so the operator continued adjusting further by trying different words (utterance 15 “bare bleie”). At this point, the operator could be more certain that the caller could understand and carry out the instructions.

Unfortunately the caller’s feedback might not always be clear, for example, if the caller were responding with backchannel responses (such as “m-hm or “ja”). In these situations, operators would have to detect hints that he or she should be adjusting. The rest of this section will present different types of adjusting to the caller: adjusting articulation, vocabulary, and clear speech. The example above illustrated all of these types of adjustments; the section below explains each type in more detail.

Adjusting how you say it: Articulation

If an operator speaks too quickly to a non-native caller, all of the words merge into one sound, making it far more difficult for the caller to differentiate separate words and information units. Consequently, even if the caller were familiar with the separate words, hearing them merged together makes the words unfamiliar. This process could be compared to trying to read a foreign language written without space between the words:

Canyoudifferentiateseparateverbalunitshere?

When speaking to non-native callers, operators should therefore pause very briefly between words, emphasizing each word or pause briefly between information units. In our analysis, we found that this strategy was more effective than when operators slowed their speech by making their vowels longer and more exaggerated. Making each word distinct in this way makes it possible for the non-native caller to know which words are unfamiliar so he or she can ask the operator for their meaning. Pausing briefly between information units brings the opportunity to ground explicitly on each instalment of information. As with all types of adjusting, the more fluent the caller is in Norwegian, the less adjusting in articulation is necessary. Utterance 7 in the

example above illustrated how an operator paused between words to make them clearer. The example below illustrates pausing between information units.

Adjusting example 2: Adjusting articulation

The caller had been having a lot of difficulty speaking and understanding Norwegian. She had seen an unconscious man lying in the courtyard of her apartment building. The operator wanted her to go check on the man. Notice how he adjusted in utterances 1 and 3 below.

1	01:42.4	01:46.6	OP	kan du ta_ med_ deg _ telefonen_ og gå ned til din_ nabo
2	01:46.8	01:47.6	CA	ja jeg
3	01:47.6	01:50.1	OP	gjør det nå _ med en gang_ jeg skal være med deg
4	01:50.3	01:51.8	CA	ja jeg skal gjøre

The operator used a combination of pausing between words and pausing between information units, making it much easier for the caller to understand his instructions.

Adjusting the words you use: Vocabulary

Some of the most important words in emergency medicine might be unfamiliar to non-native callers. Even though "breathing", "doorbell", or "moist" may seem surprisingly basic to an AMK operator, these words are not typically covered in introductory Norwegian language classes and are seldom a part of daily language in most workplaces. When operators use words like these, they should be prepared with alternatives in case the caller does not understand. If the caller understands neither the word nor words with the same meaning, the operator might need to try other strategies. The operator could demonstrate (e.g. making breathing sounds to indicate breathing) or describe the intended effect of an instruction, as the operator did in the example above (e.g., saying "bare bleie" when the caller did not understand "Ta av klærne").

It is also important to keep in mind that many words are ambiguous and have different meanings in different situations. For example, the word "problem" could refer to the patient's medical situation, a conflict, or any difficulty. It could also sound accusatory (e.g., "what is your problem"). Operators should therefore try to avoid words with ambiguous meanings and be aware that words might be misunderstood.

Adjusting example 3: Figuring out what vocabulary is not working

As mentioned previously, some words that seem very common to operators may not be familiar to non-native speakers. In this example, the operator asked whether the patient was breathing normally, and the caller's feedback to her question indicated that he did not understand the word "puster".

1	01:56.3	01:57.6	OP	Puster hun normalt
2	01:57.6	01:58.5	CA	Hva sa du
3	01:58.5	01:59.8	OP	Puster hun normalt
4	02:01.4	02:02.5	CA	Ferstår hun normal
5	02:03.4	02:04.8	OP	Ja puster hun normalt
6	02:07.2	02:12.9	CA	Huster? Unskyld jeg skjønner ikke jeg snakker norsk men ikke så riktig

The operator did not adjust her question in response to the caller's feedback. In utterance 6, the caller explained that he did not understand and explained why. After this excerpt, the caller and operator decided to communicate in English, which worked much better for both of them.

Adjusting example 4: Adjusting vocabulary

The operator was instructing the caller to put the patient in a recovery position. The caller's feedback indicated that she was not understanding the instruction. Notice how the operator was able to adjust according to this feedback and use a variety of ways to convey the instruction.

1	03:19.2	03:23.0	OP	da skal du legge han over på siden_ gjør det nå
2	03:23.9	03:24.4	CA	_siden?
3	03:24.6	03:27.8	OP	ligge på siden riktig_ i sideleie
4	03:28.3	03:28.7	CA	Sidelei?
5	03:28.6	03:31.0	OP	stabilt sideleie _ gjør det nå
6	03:31.8	03:33.0	CA	ee jeg vet ikke
7	03:32.9	03:33.6	OP	du vet ikke
8	03:33.7	03:33.9	CA	Ja
9	03:34.0	03:40.6	OP	nei han skal ligge på sin venstre side eller sin høyre side _ ligge på siden _ ikke på rygg
10	03:41.1	03:42.4	CA	ikke på rygg OK OK
11	03:42.5	03:42.8	OP	Riktig
12	03:42.9	03:43.5	CA	ja jeg forstår

The caller responded to many of the operator's attempts with information that she did not understand (e.g., utterance 4 and 6). The operator skillfully and patiently adjusted his vocabulary until the caller understood. The expression, "ikke på rygg" was the one that the caller finally understood, as shown by her explicit grounding in utterance 10.

Adjusting speech complexity: Clear speech

Besides adjusting articulation and vocabulary according the caller's feedback, AMK operators may need to adjust their sentence construction, adjusting utterances so that they are easy to interpret. Operators should keep in mind that a non-native caller has to translate everything the operator says. Unnecessary words, idioms, and complexity make direct translation very difficult.

Therefore, operators should use *clear speech*, which is direct, simple, short sentence construction that is straightforward to interpret.

There are many forms of clear speech. The following is a list of how to simplify speech to make it easier for non-native callers. The list is not exhaustive, it is just meant to give ideas about how to decrease complexity.

An operator using clear speech:

- uses no extra unnecessary words (e.g., instead of asking,"Hvor hen er han hen da?", the operator should ask, "Hvor er han").
- asks questions directly (e.g., instead of asking, "Does it smell like he might have been drinking?", the operator should ask, "Is he drunk?").
- is unambiguous about who, what, and when (e.g., instead of asking, "Is it him who has this?", the operator should ask, "Is it your husband who is having a seizure now?").
- formulates urgent instructions as instructions not as questions (e.g., instead of asking, "Can you lift him?", the operator should instruct the caller by saying, "Lift him up").
- formulates questions as questions not as statements (e.g., instead of stating "He is blue", the operator should ask, "Is he blue?" which the caller can answer with a yes or a no).
- gives questions or instructions one piece at a time (e.g., instead of asking, "is he awake and breathing?", the operator should ask two separate questions: "Is he awake?", then, after the caller answers, the operator can ask, "Is he breathing?").
- keeps negatively formulated sentences to a minimum (e.g., instead of asking, "Is he not awake?", which is difficult for the caller to answer, the operator should ask, "Is he awake?").
- Avoid dialectical forms of Norwegian.

Adjusting by making speech clearer has two benefits: (1) it is easier for the caller to understand because it is less complex, (2) it allows the operator to take leadership and responsibility in the conversation, which is what the caller both wants and needs. In the material that we have analyzed, we see that most operators in most situations use straightforward and clear speech.

It is important to remember that clear speech is a matter of adjustment. Even if most of the recommendations above could make utterances more simple, they should be used primarily when the operator believes that the caller might have a hard time understanding. In other words, they remove some nuance that might well be worth keeping in calls in which language difficulties are not a problem. If an operator were concerned that the directness of the speech seemed impolite, he or she could compensate by using a caring tone of voice.

The following section presents a few examples to illustrate the need for clear speech. In each example, the reader can see how not using clear speech created some confusion for the caller.

Adjusting example 5: Instruction formulated as a question

The operator instructed the caller to lay the patient on the floor. The caller interpreted this instruction incorrectly because the operator formulated it as a question.

1	02:36.5	02:38.5	OP	kan du legge ham ned på gulvet
2	02:39.1	02:39.6	CA	Ja
3	02:40.2	02:42.7	OP	han skal ligge den på gulvet. Gjør det nå
4	02:44.3	02:44.9	CA	OK

In utterance 2, the caller answered the operator's question, even though the operator probably meant it as an instruction. In utterance 4, the operator adjusted to this feedback and formed the instruction as an instruction. He also added further clarity about the urgency of the instruction ("do that now"). The caller's reply in utterance 4 suggested that she understood that the utterance was an instruction, not a question.

Adjusting example 6: Confusion from not asking a question directly

The caller had found an unconscious man on the street, and the operator seemed to want to know whether the man was a drug addict, but she asked the question indirectly. Notice the effect of her question.

1	02:30.1	02:33.8	OP	er han ee . hvordan er han kledd?
2	02:34.5	02:34.9	CA	Hvordan?
3	02:35.1	02:40.1	OP	hvordan er han kledd _ _ er ha . [klær] æ . e . ja hvordan klær har han på seg?
4	02:40.3	02:42.3	CA	ja e rød genser
5	02:42.4	02:42.8	OP	Ja
6	02:43.5	02:44.9	CA	og svart bukse
7	02:45.0	02:46.9	OP	ja men det er ikke han er velkledd?

The operator avoided asking a concrete and direct question to find out whether the man was an addict, and she chose instead to ask more indirectly. The caller, in utterance 4, demonstrated that she interpreted the question literally, and the operator was not able to obtain the information she needed. Note that questions like this create confusion for the caller and likely diminish the caller's trust in the competency of the operator. While the operator might find it frustrating that she does not obtain the information she needed, the caller is left wondering why the operator wanted to know what the man was wearing. A direct question would have made such misunderstandings more unlikely.

Adjusting example 7: Negatively formulated question

Prior to the following excerpt, the operator had suggested that the caller take the patient to Legevakt in a taxi. She wanted to know whether the patient would be able to get to the taxi.

1	02:26.8	02:27.9	OP	kan han ikke gå
2	02:28.5	02:30.3	CA	det ee er ikkje å gå
3	02:30.6	02:31.7	OP	han klarer ikke å gå
4	02:31.8	02:32.7	CA	je je . Ja
5	02:33.2	02:34.4	OP	klarer han å gå

Notice how the negatively formulated question created confusion for both the caller and the operator. When the caller's answer was yes (in utterance 4), the operator could not interpret the answer's meaning. The operator was able to adjust to this feedback by reformulating the question, but the negatively formed initial question wasted time.

The previous examples illustrated utterances that were unclear to the caller because they were overly oblique or complex. Another way operators can use clear speech is to keep utterances short, ensuring that each utterance contains only one piece of information rather than several. Sentences containing several pieces of information can be confusing for the non-native caller, even though, from the operator's perspective it can seem efficient to say as much as possible in an utterance. Operators should remember that the non-native caller probably must translate each operator utterance before he or she can respond. Furthermore, even if the caller gave an indication that she had understood a long, complicated sentence, the operator would not be able to tell which information the caller understood. Contributing just one important piece of information at a time can therefore have the added advantage that the caller and operator can ground explicitly on each piece of information. Two positive examples of contributing one piece of information at a time are most of the operators' utterances in Grounding example 6 and Adjusting example 1. The following is an example of contributing too much information Iin the forms of questions) at once.

Adjusting example 8: Two questions in one utterance

In the first utterance of the next example, the operator asked two questions at the same time.

1	03:02.4	03:03.9	OP	er hun våken og puster normalt
2	03:05.8	03:07.0	CA	_ee nei
3	03:07.7	03:08.5	OP	ikke våken
4	03:08.3	03:11.5	CA	e. n nei hun puster dårlig
5	03:11.8	03:14.6	OP	puster dårlig . men er hun våken og ser på deg
6	03:12.9	03:20.3	CA	ja ja hun ser på ma med øyne er lukket men hun vet jeg snakker med deg
7	03:20.5	03:22.8	OP	hun hører at jeg [ja] snakker at vi to snakker sammen
8	03:21.5	03:21.7	CA	Ja

In utterance 2, when the caller answered the two questions with a single “nei”, the operator had not made any progress in her information gathering task. The caller’s answer did not show which question the “nei” referred to, and the operator’s guess in utterance 3 appeared to be incorrect. In utterance 5, the operator adjusted and took the time to ask the questions one at a time.

Adjusting example 9: Too much information too quickly

The operator gave the caller (a mother) instructions for performing CPR on her child. Notice how much information is in utterance 1.

1	04:22.4	04:45.8	OP	og så må du puste for barnet ditt ta å legg munnen din mot munnen til barnet hold for barnets nese og blås forsiktig til brystkassa hever seg to ganger forsiktig til du ser brystkassa hever seg gjør det to ganger blås forsiktig [Breath] flott og en gang til
2	04:46.0	04:47.3	CA	[Breath]
3	04:48.8	04:52.9	OP	veldig bra også trykker du igjen tredve ganger ambulansen kommer
4	04:53.4	04:53.7	CA	To

From the response the caller gave in utterance 2 (making a breathing sound), the operator cannot be sure whether the caller has understood the rest of the instructions and is performing CPR adequately. If the operator had given the instructions one piece at a time, the caller would have been encouraged to respond to each instruction. The caller could also infer that each part of the instruction was important. The operator could correct misunderstandings along the way and be more sure that the caller was performing CPR correctly.

Summary of recommendations on adjustments

Efficient cooperation and effective communication with the caller depends a great deal on how operators adjust to the caller’s language level and knowledge level. Operator adjustments must be made based on feedback from the caller throughout the call.

1. If the caller’s language skills are limited, the operator should adjust with articulation, making small pauses between words and information units. This makes it easier for the caller to understand what the operator says.

2. If the caller does not understand a word the operator uses, the operator should at first use simpler alternatives that have the same meaning. If the caller does not understand the alterative words or expressions, the operator could try other strategies, such as:

    a. Demonstrating the word with sounds (e.g. breathing)

    b. Describing the effect of the word

3. Operators should avoid words with ambiguous meaning as much as possible.

4. If a caller's language skills are limited, the operator should use clear speech, which can be achieved by:
    a. Not using unnecessary words.
    b. Asking questions directly.
    c. Being unambiguous about *who*, *what*, and *when*.
    d. Formulating urgent instructions as instructions (i.e., not as questions).
    e. Formulating questions as questions (i.e., not as statements).
    f. Keeping negatively formulated sentences to a minimum.
    g. Giving questions and instructions one piece at a time.

Making operator's knowledge available to the caller

It is probably safe to assume that most people don't give the details of emergency system standards and processes a great deal of thought until they are in the middle of their own perceived medical emergency. Most callers, whether native or non-native speakers, likely have limited knowledge about how the emergency system works, let alone how AMK operators function within that system. Furthermore, many callers, again whether native or non-native speakers, may have only a rudimentary level of knowledge about critical bodily functions and first aid. In other words, system and medical knowledge that an AMK-operator would take for granted might be unknown to the caller. Thus, from the outset, AMK operators cannot assume that they share common ground about these areas of expertise with callers. This lack of common ground is something to keep in mind during each call. Throughout each call, operators are performing professional, essential activities about which the caller would be unaware. They might be, for instance, checking for an address, typing information in the log, noting the importance of critical information, sending the ambulance, or sending information to the ambulance paramedics. Although outside the awareness of the caller, these activities direct and influence the call.

When a caller is not aware of what is happening and why, he or she can find some of the operator's behaviours and decisions inexplicable, which creates uncertainty, confusion, and anxiety for the caller. Under these conditions, it is harder for callers to trust AMK operators, and callers might have difficulties fulfilling their valuable role of providing information, performing first aid, and being an effective and rational helper for the patient.

A reasonable solution to this issue of common ground is for the operator to share relevant system and medical knowledge with the caller. In our source material, calls go more smoothly and callers are better able to reason with the process when operators make some of this knowledge

common with the callers. Operators will have to balance the information needs of the caller with other practical considerations, but as a basic rule of thumb, the more the caller knows about what is taking place during the call the better. At minimum, if the operator finds that the caller is, without apparent provocation, beginning to act in an increasingly agitated manner, the operator should consider what information the caller might need to allay his or her anxieties. We advise that the operator adopts transparency and not only provides relevant information, but confirms that the caller has understood the information. This openness will give the caller important insight into the purpose of questions or instructions and provides reasons for the decisions about the health service the operator recommends. Such insight allows the caller to participate in the call most effectively. The cost of the time required to do this is offset by the benefits to the communication process.

Operators can keep in mind three types of knowledge that they can make available to the caller. First, operators can make information about the medical or AMK system available. Second, they can reveal their practical activities, or what they are doing, to the caller. Third, operators can provide the caller with the medical context of information. Each of these are described in detail below and illustrated with examples.

Making system information available to the caller

A non-native caller will likely not have the same level of system knowledge that the operator has. Our analysis of the source material revealed some specific system information that was unfamiliar to the callers: the ambulance is not a transport vehicle for anyone who is ill; an ambulance visit is not the same as a home visit from a doctor; AMK operators are trained health personnel; and an ambulance is not the only means of help that can be available and that other means of transport might be faster, more comfortable, and better suited to the patient's situation. When the caller does not know system information, conflict can quickly arise. For example, if the caller believes the AMK operator drives the ambulance, the caller might believe that the AMK operator's questions are delaying a process that can only begin when the call is terminated. Operators can prevent these misunderstandings by sharing system information with the caller. For example, telling the caller that the ambulance can be sent while they are speaking can be helpful. Furthermore, if the caller believes that the ambulance is the standard means for transport to and from the hospital, the caller can easily feel discriminated against if the operator declines the request for an ambulance without proper explanation.

Providing information example 1: Giving information about the medical emergency system

The caller had asked for an ambulance for his wife. During the call, the operator understood that the caller's wife had been in pain for several months, and the operator had therefore decided that an ambulance was not the best solution. Notice what system knowledge the caller does not have.

1	04:15.2	04:20.2	OP	If she is sick, and if she has been sick for several months, I would like to send a doctor to you.
2	04:21.1	04:24.5	CA	This what I ask, Ambulance..
3	04:22.7	04:29.4	OP	No, you're no- that's two different things an ambulance is not a doctor there are no doctors on the ambulance
4	04:29.7	04:32.3	CA	OK send doctor..???
5	04:30.3	04:30.8	OP	OK

The caller's response in utterance 2 reveals that he believed that asking for an ambulance was the same as asking for a doctor. When the operator shared accurate system information with him (in utterance 3), the caller accepted the operator's decision about the ambulance without further argument.

Providing information example 2: Explaining alternatives to an ambulance

The caller's friend was in labour that appeared to be unproblematic. The operator had connected the caller to a midwife (MW), who explained why a taxi was a better alternative to the ambulance.

1	05:09.4	05:14.4	MW	da kan dere ta en taxi og komme hit med en gang så skal vi ta dere imot så skal dere få komme rett opp på fødestua
2	05:14.4	05:16.6	CA	nei det er vanskelig for meg jeg klarer ikke det
3	05:16.9	05:17.4	MW	næ...
4	05:17.3	05:18.1	CA	hvis ee ja
5	05:18.3	05:21.6	MW	du skal ikke eee du skal ikke kjøre henne du du kan ringe etter en drosje
6	05:21.8	05:22.0	CA	Ja
7	05:22.5	05:28.8	MW	også kan du få taxisjåføren til å komme opp også hjelpe dere ned i bilen hvis ikke mannen hennes er der også kommer dere rett til ullevål
8	05:29.1	05:31.4	CA	er det ikke mulig å sende til ambulansen
9	05:31.4	05:32.4	MW	det er ikke nødvendig
10	05:32.9	05:33.2	CA	Akkurat
11	05:33.3	05:45.4	MW	dæ.. for når det er fem minutter mellom riene og hun er førstegangsfødene så har dere god tid på dere . og da er det ikke noe vits i å bruke ambulanse hun sitt ligger ikke noe godt i en ambulanse da . hun har det bedre i en privatbil
12	05:45.8	05:46.2	CA	OK
13	05:46.5	05:51.6	MW	også ta enten å ringe mannen hennes eller en taxi også kommer dere til oss på ullevål føde B
14	05:51.8	05:52.1	CA	OK
15	05:52.2	05:52.5	MW	Mm
16	05:52.8	05:53.0	CA	Ja
17	05:53.1	05:53.8	MW	ja fint hei
18	05:53.9	05:54.1	CA	Hei

In utterance 1, the midwife explained to the caller that she should bring her friend to the hospital right away with a taxi. The caller replied that she was not able to do that (utterance XXX). Because this reply was not explicit in terms of what the caller could not do or why the caller could not do it, it was possible that the caller had not fully understood utterance 1. The midwife appeared to pick up this possible misunderstanding and need for explanation. In utterances 5 and 6, the midwife explained about the taxi, clearing up one possible misunderstanding (that it is the caller who should drive her friend). The caller's reply (utterance 8) was a question as to why they could not get an ambulance. The midwife explained that ambulance was not necessary (utterance 9), and she elaborated by explaining the reason why it was not: there was sufficient time for a taxi, and it would actually be a more comfortable means of transportation for the friend (utterance 11). The caller accepted this explanation (utterance 12). By providing the caller with explanations both on "what" on "why", the midwife was able to make the caller understand and accept an alternative means of transportation for her friend.

Providing information example 3: Giving information about the role of the AMK operator

The caller was a mother who had called because her son was unconscious. She answered the operator's questions, but she interspersed her answers with continued (and more anxious) requests for an ambulance. In this excerpt, there were two operators. One (OP2) confirmed that an ambulance was on its way. The other operator (OP) explained system information to the caller that seemed to calm the caller down a great deal.

1	02:46.2	02:48.1	CA	Ja vær så snill vær så snill gutten min
2	02:47.2	02:49.4	OP2	Ja ambulanse er på vei nå
3	02:49.7	02:54.4	OP	Ta det helt med ro dere skal få hjelp, men for å kunne hjelpe dere best mulig må vi spørre noen spørsmål
4	02:54.9	02:55.7	CA	Ja|
5	02:55.5	02:58.4	OP	Det forsinker ingen ting at jeg spør dere noen spørsmål
6	02:58.8	02:59.2	CA	Eh|
7	02:59.3	03:04.4	OP	Og dere får hjelp altså om jeg sitter her og spør spørsmål så kjører bilen allikevel
8	03:04.8	03:06.0	CA	OK takk takk

In utterance 1, the caller's tone was very urgent as she begged for an ambulance. In utterance 3, the operator explained that the best help would be provided if the caller could answer some more questions. The caller began to reply to this information (and her tone was still agitated), but the operator continued on to explain that nothing would be delayed by her questions. The caller seemed surprised (utterance 6), and the operator continued by saying that the ambulance was coming while they were speaking. It seemed that the caller's tone of urgency and repeated requests for help may have come from a belief that an ambulance could not be sent until she was finished answering the operator's question. By the operator sharing this system information with the caller, the caller was noticeably calmer.

Providing information example 4: The location of the ambulance

Notice how, in utterance 3, the operator made information about the ambulance concrete for the caller.

1	07:29.9	07:39.0	OP	skal vi se hvor langt bilen er fra dere nå . Ehhh _ _ _ den er et lite stykke unna
2	07:39.6	07:39.9	CA	Ja
3	07:40.0	07:43.0	OP	den er på Grünerløkka nå . det er ikke så langt unna
4	07:42.0	07:44.3	CA	ja? . ikke så langt

By providing practical information about the location of the ambulance, the operator made the future arrival of help concrete for the caller, giving her a sense of the ambulance actually driving towards her apartment. In utterance 4, the caller clearly displayed that she understood that the ambulance would arrive soon.

Revealing operator activities to the caller

Some operator activities are of particular importance for callers. From our analysis of the source material, we observed that whether the operator has understood the request for an ambulance and whether an ambulance is coming are the two primary concerns for most callers. Indeed some callers are unable to answer questions and carry out instructions until the issue of the ambulance is clarified. If the caller asks for an ambulance, the operator should tell the caller that he or she has heard and understood the request and ensure that the caller understands (see section on creating mutual understanding). Callers who are not aware that the operator has heard and understood the request for an ambulance will persist in asking for one and will likely become more and more agitated while doing so. If the operator has sent an ambulance, the operator must tell the caller he or she has done so and ensure that the caller understands. Operators can make information about the ambulance more concrete for the caller by saying where the ambulance was sent (i.e., the location of the patient) and when the operator sent it. Callers may need to hear this information often, so operators can repeat it regularly throughout the call, even if they are not specifically asked about it.

Providing information example 5: Saying that the ambulance has been sent

Note that in the next, short example, almost eight minutes have passed in the call. The caller had phoned for a family member who was helpless and unconscious. She had been following instructions for CPR and cooperating with the operator. However, her question in utterance 1 suggests that she does not realize that the operator had sent an ambulance.

1	07:51.6	07:53.7	CA	Har du sendt noen til oss eller
2	07:53.3	07:57.7	OP	Jada . Sykebilen er den ene sykebilen er fremme og utenfor hos dere nå

It may have been that the operator thought the patient's situation so obviously warranted an ambulance that it was unnecessary to inform the caller that she had sent one. However, the caller might not have known enough about the symptoms or the medical system to know that an ambulance would obviously have been sent. In this situation, it is not unreasonable to surmise that the caller thought that CPR instructions were given instead of rather than in addition to an ambulance. Although this caller cooperated throughout the call, even though she may have believed an ambulance had not been sent, some callers (as we will see in the section on conflict) react more strongly and dramatically to uncertainty around the issue of an ambulance.

AMK operators do more than just talk with callers. During a call, the operator also types information, spends time referring to the Medical Index, uses computer resources. The operator may also need to talk with colleagues or other medical personnel. While attending to these activities, the operator stops talking to the caller. From the caller's perspective, a suddenly silent operator could be inexplicable and confusing. One operator told us that without exception, in her experience, unaccounted for silence from the operator created uncertainty and confusion in the call. Our analysis of the source material revealed several strategies that AMK operators use to avoid periods of unaccounted for silence. For example, when typing, they sometimes quietly say the words they are typing, which provides some "free" grounding for the caller and demonstrates that the information the caller provided was important enough to be typed into the system. Some operators, when they are checking something, say "let me see" or when they must be occupied for a moment, say "just a minute" to the caller.

Providing information example 6: Unaccounted for silence

The caller's wife was pregnant, had fallen down some stairs, and was bleeding and in pain. The caller had just explained that his wife would not accept being checked by a male doctor because she had a psychiatric condition, the end of his explanation is utterance 1, below. Immediately after his explanation, the operator fell silent. Notice that even though it is not long, it creates uncertainty for the caller.

1	03:28.4	03:32.6	CA	She doesn't accept any lady to check her any, any man
2	03:36.5	03:37.5	CA	you understand me?
3	03:38.7	03:39.2	CA	Hallo
4	03:39.5	03:40.2	OP	Yes
5	03:39.9	03:43.4	CA	sorry sorry that you don' t make [not possible to understand] I don't know|
6	03:40.3	03:44.3	OP	Please _ yeah _ wait _ just wait a second
7	03:44.1	03:44.6	CA	OK
8	03:44.6	03:45.3	OP	Yeah
9	03:44.8	03:45.3	CA	tusen tag

The caller waited four seconds before checking whether the operator had understood him (utterance 2). When the operator still did not reply, he checked whether she was still on the line

(utterance 3). The operator answered right away (utterance 4), and the caller apologized. The operator then asked him to wait a second (utterance 6). Once the operator accounted for her silence by asking him to wait, he was no longer uncertain about the silence. Subsequently the operator was silent for 30 seconds, during which the caller spoke with his children about what was happening.

Providing medical context of information

In addition to system knowledge and information about the operator's activities, operators may have to provide more explicit medical information to non-native callers. Operators know exactly why their questions are important: the caller's answers to these questions can provide the operator with the most important or critical information. Similarly, operators know why their instructions are important for the caller to carry out. However, the operator cannot take for granted that the caller shares this knowledge and awareness. It is often helpful to the caller to have information from the operator about the purpose of questions or instructions.

A non-native caller's frame of reference might be quite different from that of the operator and the general population. For example, a native caller will probably have some basic idea about what CPR is, they will have seen it performed on TV, and they may even have attended a first aid course. Even if this knowledge does not make them able to perform correct CPR by themselves, it would provide a framework for understanding the necessity of CPR and the instructions. In contrast, a newly arrived refugee might not have this frame of reference from media or education. The operator might have to explain the process and give the instructions more slowly and in more detail.

We have heard several examples of information that might not be clear to the caller. Some of these are the following: Are the instructions something that must be carried out, or are they just suggestions? Should the instructions be carried out right away or after the call is finished? For example, operators often must ask callers to check whether the patient reacts to pain, but the caller might not understand why pinching the patient is important. Or, without knowledge of first aid, it may not be clear to some callers why the patient should be moved onto his or her side instead of on his or her back.

Providing information example 7: The urgency of instructions

In utterance 1, the operator gave an instruction; then, in utterance 3, he stated that it was important for the caller to carry it out. This information helped the caller to ensure that she understood the instruction, and it informed her that she should carry out the instruction right away.

1	04:43.6	04:45.1	OP	han må ligge på siden
2	04:45.6	04:45.8	CA	Ja
3	04:46.1	04:48.0	OP	det er viktig . kan du gjøre det nå
4	04:48.6	04:50.0	CA	jeg skal gjøre ja

In addition, depending on callers' level of knowledge about first aid or health, they might not know whether information they are providing constitutes positive or negative indicators for the patient's condition. For example, although it is obvious to the operator that a crying baby is a more promising indicator than a baby who is not crying in response to pain, it may not be obvious to the caller. It can be helpful and reassuring to the caller to hear that information is a promising indicator of a positive outcome. AMK operators should keep in mind that for the caller, who is in a situation that is very stressful, clear thought and common sense cannot always be taken for granted. Therefore reassurance about what might seem obvious to the operator might be very important. Operators should also be aware that providing this information also works as a form of grounding, and therefore has an additional positive effect.

Providing information example 8: The patient's condition

Two parents had already given information about their son who had suddenly passed out. At this point, the operator had sent the ambulance and was asking questions to monitor the patient's condition. The operator used the opportunity to let the caller know that the patient was showing positive indicators.

1	05:36.7	05:38.7	OP	men han svarer på spørsmålene dine
2	05:38.9	05:39.3	CA	Ja
3	05:39.5	05:44.2	OP	det er bra. Hvordan er pusten hans puster han greit
4	05:44.7	05:45.5	MO	du puster greit
5	05:45.6	05:47.1	OP	Puster han normalt
6	05:47.5	05:49.2	MO	eh eh ja han puster normalt
7	05:49.3	05:50.7	OP	Ja men det er veldig bra
8	05:51.0	05:52.0	MO	Er det bra
9	05:52.7	05:54.2	OP	Det er veldig bra at han puster
10	05:54.6	05:54.9	MO	Ja
11	05:55.0	05:57.2	OP	Det er kjempefint, da har vi tid
12	05:56.3	05:58.0	MO	Ja _ Ja
13	05:58.0	05:59.3	OP	Da er det ikke sånn hast
14	05:59.6	05:59.8	MO	Ja
15	06:00.0	06:00.9	OP	bilen er på vei

For the operator, the information in utterance 1 obviously revealed positive information: the patient was conscious enough to answer questions. The caller might not have realized the positive implications, so, in utterance 3, the operator shared her evaluation. Although "det er bra"

is not a full explanation, it gave the caller the information that was most relevant to her (that her son was doing well). In utterance 7, the operator again shared her evaluation of the information about his breathing (which happened to be very well grounded). Utterance 8 suggested that the caller might be unsure whether breathing normally is a good thing or not, which demonstrates the importance of providing information that might seem obvious to the AMK operator. In utterance 9, the operator repeated the positive evaluation and even specified what was good (at han puster). In utterance 11 and 13 the operator also shared her evaluation on what this means on a practical level and why it is good ("da har vi tid" and "Da er det ikke sånn hast"). In addition, the operator repeated that an ambulance had been sent ("bilen er på vei") and, in doing so, she reassured the caller that positive signs did not change her decision to send an ambulance. Together this information had a calming effect on the caller, making her more able to answer questions and conduct tasks.

Finally, in general, providing the caller with positive feedback can be calming and reassuring for the caller. If the operator feels that the caller is being cooperative and providing valuable information, then the operator should share this impression with the caller. An example of this is below.

Providing information example 9: Positive feedback about the caller's cooperation

Previous to the next example, the operator and caller had been in conflict, and the caller's wife took over the call for awhile. However, the wife did not speak Norwegian as well as her husband, so when the operator asked about the patient's birthday, the wife could not answer the question and had to ask her husband to come back on the line. Notice how the operator briefly compliments his answer.

1	03:44.8	03:46.3	OP	men når er sønnen din født
2	03:47.7	03:51.6	MO	Ehh [ukjent språk]
3	03:51.7	03:53.5	CA	Fjerde i sjette nitten åtti ni*
4	03:54.0	03:55.6	OP	Fjerde i sjette nitten åtti ni*
5	03:56.0	03:56.4	CA	Ja
6	03:56.6	03:59.6	OP	Ja _ Flott hva er det han heter for noe

*date altered to preserve anonymity

In utterance 6, the operator inserts a quick compliment ("flott") in between grounding with the caller and asking the next question.

Summary of recommendations on making operator's knowledge available

Few people outside the AMK have extensive knowledge about how the emergency cluster is organized; some have almost no knowledge at all. It is therefore important that AMK-operators

are aware that callers might need information about what is happening, when it is happening, and why it is happening. This transparency helps the caller to do what needs to be done, whether it is answering questions or perform tasks.

1. Operators should share their knowledge about the system and about their activities by explaining what the operator is doing and how the operator is evaluating the situation.
    a. Operators might need to inform the caller that the ambulance and the AMK are two different things, so the ambulance will drive even if the operator continues to ask questions.
    b. Operators should not fall silent when typing, checking index, talking to colleagues etc. without informing the caller first.
2. If the operator has decided to send an ambulance, the operator should inform the caller repeatedly through the call that an ambulance will arrive to the given location soon. Remember that this information has three important components; (1) that it has been sent, (2) *where* it has been sent (location) and (3) *when* it was sent (e.g., now, several minutes ago).
3. Operators should inform callers about the AMK process by giving callers insight into the purpose of questions, instructions, and decisions. For example, the operator should always inform the caller *when* the given instruction needs to be carried out.
4. The operator should inform the caller about indicators of positive outcome when revealed.
5. The operator should give the caller positive feedback when appropriate.

Conflicts

Conflicts emerge when the operator and the caller are pursuing incompatible purposes, such as when the caller is focused on requesting an ambulance, but the operator is focused on gathering information. *Open conflict* emerges when these conflicts of interest manifest in open displays of frustration, agitation, accusations, or threats. Conflicts create stress for both the caller and the operator. For the caller, who is probably already in a frightening situation, a conflict can increase stress enormously. For the operator, conflicts are exhausting and demoralizing. Operators have told us that calls that involve a conflict linger with the operator, remaining troubling and distracting far after the call is completed. On a purely practical level, a conflict brings a great deal of inefficiency into a call because it moves both the operator and the caller away from solving the main focus of the call, which is to get appropriate help to the patient as quickly as possible. For these reasons, operators should learn to use strategies that limit the chances for open conflict to erupt.

The first part of this section presents some conflict avoidance strategies. The second part presents operator behaviours that can be problematic and that often result in conflict. The third part describes operator behaviours that our analysis has shown intensify open conflict.

Avoiding conflict

Conflict avoidance strategies provide ongoing reassurance to the caller, which helps the call to go more smoothly and effectively. Furthermore, these strategies have an additional, and in many cases, more crucial, benefit. By preventing or resolving misunderstandings, these strategies improve the efficient exchange of information between operator and caller. Therefore the operator should use these strategies throughout the call. The conflict avoidance strategies that are described here are: to calibrate on the caller's tone, to reassure the caller that his or her request for help was understood, and to recognise and correct misunderstandings.

Calibrating on the caller's tone means that the operator uses a tone of voice that matches the intensity of the caller's tone. For example, if the caller sounds desperate and frightened, the operator should sound serious. This strategy is an efficient way to communicate to the caller that the operator has understood that the caller feels the situation is urgent. Moreover, calibrating on the caller's tone reduces the need for the caller to escalate to a more urgent or desperate level. Note that calibrating on a tone of urgency does not necessitate that the operator agree fully that the situation constitutes an emergency. Instead, it signals to the caller that the operator recognizes and acknowledges that the situation is urgent for the caller. Thus by calibrating on the caller's tone, the operator helps to establish trust and cooperation with the caller.

Callers often begin a call to 113 with an outright request for an ambulance or for help. *Reassuring the caller that the request for help was understood* means that the operator should explicitly acknowledge this request. By acknowledging the request, the operator demonstrates that he or she has understood it. Note that this acknowledgment does not mean that the operator should say he or she will send an ambulance; it is simply a signal that the operator has understood the caller's request.

Conflict example 1: Reassuring the caller that the request for an ambulance was heard

In utterance 2, the caller asked for an ambulance. Note that this was the caller's first utterance in the call.

1	00:09.7	00:11.0	OP	Medisinsk nødtelefon
2	00:11.4	00:13.1	CA	Ah please we need ambulance
3	00:13.5	00:14.4	OP	you need ambulance
4	00:14.5	00:15.0	CA	Yes

The operator acknowledged the caller's request in utterance 3. Note that she did not say she would send an ambulance. The caller's feedback in utterance 4 indicated that he understood that she heard his request.

Conflict example 2: Telling the caller that help is on the way

In utterance 1, the caller requested help.

1	01:15.6	01:18.6	CA	Ja men dere må komme her.
2	01:18.0	01:21.1	OP	Ja vi skal gjøre det men dere må hjelpe han til vi kommer
3	01:21.5	01:22.0	CA	Ja

In utterance 2, the operator reassured the caller that she would receive help, and the operator added that the caller could help the patient until that help arrives.

In addition to calibrating on tone and reassuring the caller that the operator has heard the request for help, *recognizing and correcting misunderstandings* can relieve uncertainty in the call and help to minimize conflict. The previous section of the report on grounding presents both information and examples for how to establish mutual understanding. Our analysis has shown that when the operators ground on information clearly and explicitly, it seems to minimize the chance for later conflicts to emerge.

The next section shows how conflicts can emerge as a consequence when operators do not use these three conflict avoidance strategies.

Behaviours that lead to conflict

In the material we have worked with, we have seen that failing to calibrate on the caller's tone, not reassuring the caller that the caller will receive help, and not recognising and correcting misunderstandings all play a role in the emergence of conflict. Often when conflicts seem to appear suddenly and apparently "out of nowhere", we have found that the conflict was actually preceded by miscalibrations, a lack of reassurance, and misunderstandings. These three behaviours are described in more detail below.

First, when an operator does not calibrate on the caller's tone (e.g., a caller with an urgent tone is met by an operator with a calm or institutional tone), the caller cannot be sure that the operator has heard the caller's sense of urgency. As mentioned previously, if the caller believed the operator did not perceive the tone of urgency, the caller could escalate his or her tone to a more emotional level in an attempt to make the operator understand. If the caller believed that the operator did understand the tone of urgency, but would not acknowledge it for some reason (e.g.,

because he or she felt the caller's reaction was unjustified or irrational), the caller could become angry and more desperate, leading to open conflict.

Second, when a non-native caller makes a request for help or for an ambulance and the operator does not acknowledge the request, the caller cannot be sure that the operator has understood. In their everyday interactions with native Norwegian speakers, non-native speakers are likely accustomed to not being understood and having to repeat themselves. It is difficult for these speakers to know whether they have said something clearly enough to be understood. In the material we have analyzed, when the operator does not explicitly ground on the caller's request for help, the caller tends to repeat the request until the operator finally acknowledges it. Typically, as the caller becomes more and more desperate, these requests escalate in emotional tone. The caller's attention appears to be focused on making sure the operator understands the request. Consequently, the caller cannot focus on answering the operator's questions and following instructions. The uncertainty that unacknowledged requests brings to the calls can contribute greatly to conflict.

Third, misunderstandings between caller and operator create uncertainty. Uncertainty about what the situation is, whether the situation is about to be solved or how it will be solved, all contribute to open conflict. In addition, when either the operator or caller ignores or misunderstands some information, the caller becomes a less reliable resource for the operator, and it becomes difficult to ensure that the patient is receiving adequate and appropriate help. Uncertainty and confusion makes both the caller and the operator question the legitimacy of each other's actions. For example, in one of the actual calls in our source material (presented in *Listening example 6: Making clear what is not understood*), there was confusion about the patient's condition. The operator believed that the patient was breathing, while the caller was trying to indicate that the patient was having severe problems breathing but was not able to express that information clearly to the operator. From the operator's perspective, the actions of an insistent and angry caller who was demanding an ambulance were unwarranted and frustrating. From the caller's perspective, if he had believed that he had made it clear to the operator that his wife was not breathing, when the operator focused on less critical issues, the caller would begin to question the legitimacy of her role and competency. Such misunderstandings erode trust between caller and operator, and they not only tend to generate open conflict, but they also endanger the patient.

Conflict example 3: The danger of ignoring what is not understood

The caller in this example had an accent that made him very hard to understand. He contributed information about the patient's background and condition in utterances 1 and 3. Notice how the operator's responses in utterances 4 and 8 indicate that she could not have understood all of the information.

1	00:32.4	00:38.7	CA	She ah, ah She was <u>in hospital six months</u> <u>She broken her neck</u>|
2	00:38.1	00:40.4	OP	But . yes?
3	00:40.9	00:46.6	CA	and ah--- She <u>drink a little</u> and <u>was ah aggressive</u>, you know|
4	00:45.7	00:48.4	OP	what, what ha, ha llo what did she drink?
5	00:49.5	00:50.3	CA	a beer

6	00:50.6	00:51.3	OP	a beer?
7	00:51.5	00:52.0	CA	Yes
8	00:52.1	00:54.5	OP	OK, what is the problem with the beer

The operator's responses in utterances 4 and 8 clearly indicate that she could not have understood that the patient had spent time in the hospital because of a neck injury. By ignoring what she had not understood while explicitly grounding on and asking follow up questions about the drink, the operator created confusion and uncertainty in the call that contributed to open conflict very shortly after this excerpt. Ultimately the caller hung up before he and the operator could establish mutual understanding about the patient's condition.

Conflict example 4: Ignoring evidence that the caller has not understood

In this call, the caller was a father whose son was unconscious. At the beginning of the call, the caller described his son's condition and the operator provided the term "kramper". However, it was not clear that the caller had understood what "kramper" meant. In utterance 1, below, the operator was trying to find more information about the "kramper" by asking how long it had lasted. In utterance 2, the caller provided the answer that it happened just now, which indicated to the operator that he had probably not understood the question. Note what happened in the subsequent utterances, and how conflict emerged as a result, especially when the operator asked the question again.

1	01:07.3	01:09.8	OP	Dette krampeanfallet hvor lenge varte det
2	01:10.3	01:11.2	CA	akkurat nesten nå
3	01:11.9	01:12.3	OP	Jomen
4	01:12.3	01:13.3	CA2	[ukjent språk]
5	01:13.5	01:19.5	CA	han har sovnet så plutslig kom han opp og sånn opp og jeg vet ikke vet du om [nei] vi får ambulanse eller ikke vær så snill
6	01:19.6	01:24.5	OP	Slapp helt av, du skal få hjelp men jeg må få lov til å spørre deg noen spørsmål først OK
7	01:25.0	01:25.3	CA	Ja
8	01:25.6	01:27.5	OP	ja har han hatt kramper før?
9	01:28.7	01:31.9	CA	Du jeg vet ikke han var bare plutslig sånn jeg vet ikke hva skjedde med ham
10	01:31.9	01:32.5	OP	Nei Neimen
11	01:32.2	01:33.5	CA	Vondt i hjertet eller noe sånt jeg vet ikke
12	01:33.7	01:40.6	OP	Nei Nei Tas også hør på meg også svarer du på spørsmålene mine dette hjelper meg å gjøre min jobb å hjelpe deg bedre OK
13	01:41.1	01:41.3	CA	Ja
14	01:41.4	01:43.3	OP	Ja Harn fortsatt kramper
15	01:44.1	01:46.7	CA	Ja nei litt nå Han kan ikke bevege seg heller
16	01:47.3	01:50.3	OP	Nei, men, men, men han er våken og han puster greit
17	01:51.0	01:51.9	CA	Ja det gjør (vi?)
18	01:52.3	01:55.8	OP	Ja Dette krampeanfallet, når begynte det
19	01:58.0	02:00.8	CA	Jeg skjønte ikke HVA DE [HVOR HVOR] -JEG MENER (FY FAEN?)
20	02:00.9	02:03.0	OP	Hvor lenge har han vært sånn rar

21	02:03.8	02:09.9	CA	HVOR LENGE HAN HAR VÆRT SOM FAEN DET ER AKKURAT NÅ JO HVORFOR DET ER PÅ (ANKHJELP?) HVOR ER DET HVORFOR ER DU DRIVER MED
22	02:10.2	02:10.3	OP	Eh
23	02:10.3	02:11.9	CA	FOR FAEN VI TRENGER

In this call, at first glance, the conflict emerged suddenly (in utterance 19) and seemingly without real cause. However, by taking into account uncertainty about the meaning of "kramper" for this caller and the caller's frustration at having to answer questions that he had already (from his perspective) answered, one can see that the conflict was neither sudden nor inexplicable. In addition, the operator, in utterances 6 and 12, told the caller to answer her questions using words that could be interpreted as suggesting that he had been unwilling to do so. These remarks, combined with the undetected misunderstandings earlier, seemed to have helped to inflame the conflict. We will refer to utterances 6 and 12 again in the section immediately below.

Behaviours that escalate conflict

We have discovered a few types of behaviours that can worsen an emerging or open conflict. The following section describes some specific behaviours that operators should avoid as much as possible. First, operators should avoid insisting that the caller do something that the caller is already doing or that he cannot do. Second, operators should avoid accusing the caller, whether the operator feels that the accusation is reasonable or not. Third, operators should try to avoid implying that the operator can withhold help unless the caller cooperates. These are described in more detail below.

Operators should *avoid telling the caller to do something that the caller cannot do or that the caller is already doing.* Often operators might not be fully aware that they are doing this, but from the caller's point of view, some instructions may be impossible for the caller to carry out and some questions may be impossible to answer. In these cases, the caller might become frustrated, and so operators should be aware of this possibility. For example, if a caller is not with the patient, he or she probably cannot answer questions about the details of the patient's condition. Sometimes operators ask callers to do something that the caller is already doing. For example, in our source material, there are instances of the operator telling the caller to answer questions when the caller has actually been answering questions. The above example illustrates a consequence. When the caller had been providing information and answering questions, it may have been inflammatory for the operator to tell him to answer questions while implying that he had not been. In these cases, perhaps the operator has not been receiving the answers he or she expected or needed. However, for a caller who is already stressed and who has been trying to answer questions, the direction to answer questions is inexplicable. Such operator behaviours seem to escalate conflict. An alternative to this behaviour would be to compliment the caller (e.g., on his or her cooperation, when the caller is being cooperative).

Conflict example 5: Instructing the caller to calm down

Prior to the excerpt in the following example, the caller had sounded quite agitated and desperate and had been in conflict with the operator. However, in this excerpt, he had calmed down enough to help the operator to clarify information that she had gathered. Notice that while the two of them were making further progress towards gathering accurate information (utterances 2-6), the operator interrupted by telling the caller to calm down (utterance 7).

1	02:45.0	02:51.9	OP	The bi- the problem is that you are shouting and you are not telling me the problem because I would like to help you
2	02:50.8	02:58.3	CA	I tell for you I tell for you that she have problem with her neck she has broke and make operation
3	02:55.9	03:01.0	OP	She has- Please don't yell, she has problem with her neck
4	03:01.2	03:02.2	CA	Yes
5	03:01.9	03:04.5	OP	OK. Is this Anna Petrov*?
6	03:04.6	03:05.0	CA	Yes
7	03:05.0	03:07.4	OP	OK. Try to calm down please.
8	03:07.9	03:08.6	CA	What
9	03:07.9	03:10.4	OP	OK? You must try to calm down
10	03:08.9	03:09.5	CA	What

*The name is changed and randomly selected

In general, few people would say that having someone tell them to "calm down" has the desired effect. From this caller's perspective, especially when he had already calmed down enough to answer questions, having the operator tell him to calm down (utterances 7 and 9) was inexplicable. His responses in utterances 8 and 10 ("what") demonstrate his confusion. By asking him to do something he was already doing, the operator delayed the gathering of further accurate information, and she could have easily moved the interaction back into open conflict.

Operators should *avoid accusing the caller*, whether the operator feels that the accusation is reasonable or not. Accusations escalate conflict and will often make the caller defensive.

Conflict example 6: Accusing the caller

Prior to this excerpt, because of his language difficulties and strong accent, the caller had been having a great deal of difficulty explaining the patient's condition to the operator. He had been answering questions, but appeared to be getting frustrated and agitated. Also, there was a lot of shouting in the background, and he had to divide his conversation between the operator and the patient. In addition, because of his very limited English vocabulary, his answers and contributions of information were repetitive. For example, he used the expression "strong wound" many times, in an increasingly intense tone of voice. The operator used an accusation in utterance 5.

1	03:29.6	03:35.9	CA	Yes because she have operation and is a very strong wound. So strong wound, and she tired from this
2	03:29.8	03:30.4	OP	Yes [noise and shouting in the background]
3	03:36.0	03:40.3	OP	So she is tired from having pain, and- Does she take any pain medication?
4	03:40.4	03:42.1	CA	Help me, also
5	03:41.9	03:44.8	OP	I am trying to help you <u>but you are not helping me</u>
6	03:45.1	03:47.2	CA	It's because she try to fight me
7	03:45.3	03:48.3	OP	I am trying to understand what kind of help you need

In utterance 5, the operator accused the caller of not helping her. This could be interpreted by the caller as an accusation that he was not willing to contribute the necessary information that would help the patient. Being accused of not being willing to help someone close to you is a strong accusation and could easily make the caller more frustrated and angry. The accusation in this call, whether justified or not, served no practical function in the call. Instead it created more conflict and did not help the caller to cooperate with the operator in order to help the patient.

Finally, operators should *avoid statements that suggest that the operator might (or could) withhold help* if the caller does not cooperate. Although we have not come across outright statements from the operator that he or she will not help unless the caller cooperates, we have found many instances in the calls where conditional help is implied. For example, in statements such as, "I would like to help you, *but* you must calm down" or, "I will help you, *but* you must answer my questions", the word, "but" suggests that help is conditional. Avoiding these conditional statements is especially important in calls where there has already been open conflict, and the caller's trust in the operator may have already been eroded. People under stress or in conflict have a tendency to interpret ambiguous utterances as being more of a threat [21-22].

Conflict example 7: Implying that help is conditional

The following excerpt comes from a call from a father calling because his son is unconscious. The father had been trying to explain what happened, but his limited vocabulary had been making it difficult for him to establish mutual understanding with the operator. Prior to this excerpt, the operator and caller had been in open conflict. Whereas the caller had repeatedly asked for an ambulance, the operator had tried to gather information using her questions and had not been satisfied with the answers the caller was contributing. In utterance 2, the operator used a conditional statement that implied that she could withhold help unless the caller cooperated.

1	01:17.4	01:19.5	CA	vet du om vi får ambulanse eller ikke vær så snill
2	01:17.4	01:24.5	OP	Nei _ Slapp helt av, du skal få hjelp <u>men</u> jeg må få lov til å spørre deg noen spørsmål <u>først</u>, OK
3	01:25.0	01:25.3	CA	Ja

Summary of recommendations on conflict

Conflicts are frustrating, exhausting, and demoralizing for both callers and operators. Furthermore, conflicts waste time in what is arguably a very time sensitive setting. They pose a serious risk to the patient because they direct the operator and the caller away from attending to the patient's condition. Finally, conflicts are often symptomatic of misunderstandings. That is, clearing up misunderstandings and ensuring mutual understanding will often lessen the chance for open conflict to emerge. For all these reasons, operators should invest time and effort to avoid conflicts, should resolve them before they become open conflicts, and should reduce them once they have emerged.

1. Operators should use a tone of voice that matches the intensity of the caller's tone.
2. Operators should explicitly acknowledge the caller's request for an ambulance.
3. Operators should use recommendations stated in the previous sections to relieve the caller's uncertainty; namely, they should use strategies for developing mutual understanding by detecting and repairing misunderstandings.
4. If a conflict has emerged, operators should avoid instructing the caller to behave in a way that the caller is already doing (e.g., saying, "calm down" when the caller has calmed down or saying, "you must answer my questions" when the caller has been answering them) or perform a task that the caller cannot do (e.g., answer questions that would require observing the patient when the caller is not present with the patient).
5. Operators should avoid accusing the caller, whether the operator feels the accusation is reasonable or not.
6. Operators should avoid implying that getting help for the patient is conditional on the caller's cooperation and "good behaviour".

Advice to AMK leadership and administration

The recommendations in this report have thus far focused on AMK operator behaviours during calls from non-native callers. However, improving communication skills, whether with native or non-native callers, should be an institutional priority and should be given equal weight as medical skills currently are, both in attention and in financial investment. This last chapter focuses on how AMK leadership can effectively implement the recommendations in this report. By implementation, we mean administrative and educational activities that will make it possible for this knowledge about communication to be used most effectively [61]. This last chapter should be read as a condensed summary of suggestions for implementation; that is, elaborated details and plans are not provided here.

This chapter is divided into four sections. The first three sections concentrate on what AMK leadership could do internally to improve training, conduct evaluation, and facilitate operators' communication with non-native callers. The last section outlines what AMK leadership could do externally to educate the general public about emergency medical calls and the AMK system.

Training of AMK operators

In terms of the content of training and professional development, it is important to distinguish between communication and medical training. Because effective communication is a medium by which AMK operators use their medical knowledge in practice, both skills are equally necessary for AMK operators to fulfil their assignment safely. For example, an operator may have had the medical expertise to know that a patient's condition warrants a code red response. However, without effective listening, adjusting to the caller, and explicit grounding, that operator may gain inaccurate information or not enough information about the patient's condition to use that medical expertise. Or, if open conflict emerges because of preventable misunderstandings, the operator's medical expertise may be temporarily supplanted by the immediate need to calm the caller down and remediate the conflict. This report has outlined several specific communication skills on which the operator should focus. What is outlined below is how AMK leadership can implement the advice stated in this report.

A systematic, institutionally supported plan for how operators can integrate new awareness and knowledge into their practice is best met considering two points. First, operators will not acquire these skills merely through experience [30, 62] or just because they hear about them once or twice in a seminar [63]. In order to be able to use this new knowledge to enhance their own professional communication skills, they will have to practice these skills regularly and deliberately [62, 64-65]. Second, operators will learn the contents of these skills most thoroughly if they are presented in manageable, short units (e.g., focusing on listening at first, then adjusting to the caller, then grounding, and so on). We recommend that operators work through each unit with short, theoretically-oriented seminars or workshops, then have resources available for individual follow up and feedback, and finally the opportunity for peer feedback in pairs or small groups [65-66]. (Additional details about feedback are provided in the paragraph below.) An ongoing, cyclical training program requires that AMK leadership integrate regular attention, practice, and feedback into the operators' schedules so that they can focus on this aspect of their professional development.

On feedback. By *feedback*, we mean the process by which operators are provided with specific information and guidance regarding their specific communication behaviours in their calls. Feedback requires an opportunity to listen to a call once it is finished. Operators can listen to their own calls and use the recommendations in this report as a means to reflect on their own practice. However, it is likely that the operator would be distracted by his or her intentions and impressions during the call. Consequently, the operator might find it difficult to focus more objectively on the behaviours themselves and how they influenced the call as it unfolded. Therefore, we recommend that feedback is best offered in conversation with a colleague. Ølberg has proposed a system of feedback in pairs, where, for example, in one shift every few weeks, each operator could pair up with a colleague to listen to each other's calls and provide feedback. Ideally, recordings of calls for this purpose could be accessed and reviewed immediately, while the all is fresh in the operator's memory. Another feedback activity that we can recommend is to conduct regular *log groups*, during which operators meet with three to four peers to listen to their own calls, make observations, receive feedback, and discuss what could have led to the best outcome. Although in the past, log groups focused on medically-oriented information in the calls (e.g., the ability to interpret the import of symptoms while making the decision about dispatching resources), they would be the ideal setting for the improvement of communication skills as well. The use of sound log groups with co-workers as communication trainers has had a positive effect in a legevakt-setting [67].

Whether feedback occurs in pairs or in log groups, in order for operators to feel comfortable receiving feedback on their calls, log groups will require regularity, expertise, and a supportive environment. *Regularity* is required so that operators become accustomed to making observations, integrating learned concepts with new ones, showing precisely where and how operators used communication effectively, and suggesting alternatives that could have led to

different outcomes. Such systematic reasoning focused on communication must become routine, and enhanced skills will come only from regular practice and feedback [62, 64-65]. *Expertise* will be required to identify the role communication plays in the calls, distinguishing among communication issues and those of medical expertise, triage routines, or system knowledge. Each log group will need a leader with this expertise, and we highly recommend that each leader comes internally from AMK [68]. This recommendation is easily met, as a core group of operators who are interested in communication with non-native callers has emerged through their involvement in the collection of the simulated call data for this report. Finally, a *supportive environment* will be required for operators to be willing to put their calls "under the microscope" and to receive not just positive feedback, but also constructive criticism from their peers [65]. The right tone can be set in early training of the leaders for the log groups and from the type of calls operators are encouraged to bring into the log groups. Positive, visible feedback is conducive to change in practice [69]. From a communication-training point of view, the so-called typical, relatively unproblematic calls will provide ample opportunities for learning. Each of the calls we analyzed for this report had moments that went well and moments that could have gone better.

Evaluating AMK operators' work

Regular evaluation widely considered to be important for maintaining quality and effectiveness at the workplace. The current evaluation scheme for operators at AMK Ullevål involves reviewing a selection of each operator's calls and assigning points according to a set of specific criteria. Note that how AMK operators gain or lose points will have a direct effect on their day-to-day practice. Therefore evaluation of communication must be constructed such that it does not create unintended barriers to good practice.

As mentioned previously, non-native callers bring contextual challenges (in terms of their language, system knowledge, and frame of reference) that the operator can remediate with good communication practices (e.g., by listening carefully, calibrating, grounding explicitly). Gaining accurate information and reducing the uncertainty and anxiety of the caller may take some extra time at the beginning of the call. Of course time is arguably critical in emergency calls; however, the current evaluation scheme focuses on time without always taking into account the contextual challenges associated with non-native callers. Operators may feel forced to rush (e.g., interrupting the caller, not grounding carefully) in order to meet the time requirement, while not taking the time to make sure they have understood the caller correctly. An evaluation method that treats all calls equally, without regard to these contextual challenges, will discourage operators from adapting to them in their everyday practice.

If the following guidelines are followed, evaluation of communication skills can also provide operators with an educational opportunity and additional professional development. First, each operator's evaluation should involve at least one meeting with the evaluator during which the two of them listen to and discuss in detail one or more calls. Second, calls selected for these

meetings should demonstrate both successful and not so successful moments. Outlier calls (i.e., those that proceed perfectly or that disintegrate into open conflict very quickly) are ill-suited for constructive learning purposes. Third, evaluations should focus on the communication concepts covered in this report, using these concepts as a way to discuss the call with the operator. Fourth, when listening through a call, evaluators should focus on communication at an utterance by utterance level. This is how the effect of communicative behaviours can be observed (e.g., What happened when the operator asked this question? Or grounded this way? How did the operator respond to this piece of information?) and alternative possibilities can be explored (e.g., What other question might have been more effective? Could there have been a better way to ground that information?). Evaluators can also divide the call into shorter episodes (e.g. openings, gathering address, giving instructions, etc.). Focusing on shorter episodes prevents the temptation to label the whole call as either successful or not successful, and it is more likely to reveal specific skills that the operator can improve.

In summary, communication skills should be as firmly embedded into the evaluation processes as medical skills currently are. For this to be achieved, leadership and those involved in evaluation should obtain a good understanding of communication and the concepts introduced in this report.

Facilitating for efficient communication

AMK leadership should adopt strategies at the workplace to facilitate effective communication with non-native callers. Four possible strategies are (1) to introduce a system of documentation of these calls, (2) to offer practical, hands-on resources at the workplace, (3) to recruit AMK operators with additional language competency, and (4) to consider the use of interpreter services. We will address these four strategies below.

Introducing the documentation of calls with non-native callers is an optimal first step in gaining more accurate insight into the extent of the challenges that language difficulties bring to emergency AMK settings. Mapping the scope of these challenges provides AMK with an overview to support the use of much-needed resources, such as the communication training of AMK operators. Therefore all AMK operators should be able to register the occurrence of language difficulties within the current documentation system (i.e., logs). Such systematic registration will have the additional benefit of facilitating access to relevant calls for log groups and for more practice-relevant research to be done in the field.

A second strategy for facilitating effective communication with non-native callers is to *create and provide easily accessible, hands on resources in the operators' immediate work environment*. These could include tailor made, practical phrase books and dictionaries for use within the AMK centres. The phrase books should include translations of critical, relevant words/phrases into the major world languages and the most used languages among immigrants in

Norway. In addition to vocabulary translations, the phrasebooks should include some alternative word/phrases in Norwegian that could be useful if the standard ones are not working for a particular caller. AMK operators should be encouraged to actively collaborate on the content of these materials by contributing words and phrases that they have experienced to be problematic in their own calls. This material should available in print at the AMK centres as well as accessible through each operator's computer resources.

Another strategy could be that AMK *actively recruit more personnel who have language proficiencies over and above fluency in Norwegian and English*. Languages of interest could include, but not be limited to, those languages that are most common among immigrant populations in Norway, such as Polish, Arabic, Somali and Urdu. To emphasize that language skills other than English and Norwegian are considered a relevant asset, AMK should be explicit in announcements and during job interviews that these skills are a valuable criterion for hiring. In addition to the obvious advantage afforded when operator and caller share the same language, having personnel with these skills in the workplace will give AMK, as a whole, additional competency and shared understanding of the key role of communication in this setting. However, this strategy could be problematic for the following reasons. First, it would take time in the call to figure out what the caller's native language is, and this time might be better spent figuring out what the emergency is instead. Second, this suggestion would of practical use if the non-native caller could be linked to an operator with the same native language who was also on shift and available (i.e., not talking to another caller) at that time. This strategy is thus best characterized as one for increasing competency in general at the AMK workplace while still ensuring that all AMK operators have effective communication skills to address the needs of non-native callers.

A final strategy could be for AMK to *investigate whether the use of telephone interpreter services is feasible* to arrange in the medical emergency call setting. If the Norwegian health care system are to develop 24 hour interpreter services that are available country-wide, AMK should consider making use of them. However, AMK needs to be aware that although sharing the same language or using an interpreter might help to minimize misunderstandings, most of the recommendations in the report apply equally to calls where caller and operator share the same language. For example, the most effective processes by which mutual understanding is established or by which conflict can be avoided or remediated would still need to be introduced and practiced, whether the operator and caller share the same language or not. In addition, like the above strategy, this one has some practical considerations. First, again, it would take time to figure out what the caller's native language is. Second, it would take time to contact an interpreter and connect the interpreter on the telephone line with the operator and caller. However, in some cases, an interpreter could help to minimize uncertainty in the call if there is time, and this strategy could be combined with all of the others in this report to make as many resources available as possible to AMK operators and non-native callers.

Programs for educating the general public

Strategies for improving communication between operators and non-native callers can extend beyond the workplace and into the immigrant community itself. AMK leadership can provide opportunities for members of immigrant communities to improve relevant language skills, and gain knowledge about what AMK is and how they operate. Each of these is outlined in more detail below.

We strongly suggest that teaching relevant vocabulary (e.g., medical and health care terminology) and knowledge about first aid and AMK is integrated into Norwegian as second language classes. Even if this is ultimately a responsibility for language institutions, the AMK can initiate and collaborate this process. This initiative could include the following strategies. First, the need and importance for a program should be communicated clearly to the responsible institutions. Second, because AMK are the experts in the field, they should collaborate on the production of relevant teaching material. Note that a small scale pilot project along these lines has recently been initiated by NAKMI.

In addition, AMK can produce and distribute information about first aid and the emergency system in the languages of the major immigrant groups. These could be in the form of information folders and posters. Relevant arenas could include schools for adults, regular schools, cultural events, institutions where immigrants gather, and asylum centres. The Norwegian Red Cross and Norwegian People's Aid could be relevant partners for these projects. This information could be supported and enhanced by initiating first aid courses for immigrants.

Finally, AMK can collaborate with the immigrant organizations, the immigrant press, and the general press to distribute knowledge and information. We believe that as a public relations strategy, the AMK would benefit greatly by adopting more transparency in their work. Making the nature and process of the role of AMK more familiar to the general public would increase the public's confidence and trust in the institution. Initiatives along these lines have already begun within the ambulance service, police, and fire department with the production of NRK Migrapolis "Livredderne". These initiatives could provide templates for undertaking similar projects within the AMK.

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Appendix A: Simulated call data collection

Data collection took place over three days in 2009 (October 8, October 19, and November 20) with participants in two locations. The callers were at PMV in Oslo and the AMK operators were at Kokom in Bergen. On Oct 19, due to a flight delay and the malfunctioning of equipment at Kokom, no calls were made. The same volunteer callers from this day were able to participate on November 20 instead.

Participants

Callers. PMV recruited 25 immigrant callers. Callers were compensated for their time: Kokom provided this financial compensation for two of the dates, and NAKMI contributed to it to compensate the callers for the time they spent at PMV on the day no calls were made. The callers came from the following immigrant groups: 10 Arabic, 5 Pakistani, 6 West African, and 4 Somali. All members of the West African group spoke English fairly fluently, but did not speak Norwegian well. In each of the remaining three groups, one caller was a "natural helper", who was a member of the immigrant group who could spoke Norwegian well enough to act as a liaison and interpreter between the coordinators and the other participants. All other callers did not speak Norwegian well. Twenty-two callers were female; three were male.

AMK operators. Ølberg recruited seven operators from AMK Ullevål. One was not able to attend the extra data collection day on November 20, so six operators contributed to the source material.

Equipment and materials

The callers called from a land line at PMV in Oslo. The AMK operators took the calls from the simulation centre at KoKom in Bergen.

Ølberg provided five scenarios for the calls, including a photo of a burn victim for a call where the caller might have to describe a burn. There was a short set of questions for interviewing the callers after the calls and another for interviewing operators. Note that these interviews are not discussed in this report and will not be elaborated on here.

Procedure

Five people were required to coordinate the activities. Ingrid Ølberg managed the AMK operators, accompanying them from Oslo to in Bergen. Åge Jensen hosted the operators, ensured the equipment was working, recorded the calls, and interviewed operators. Jennifer Gerwing oversaw logistics at PMV. Ruth Paintsill and Arild Aambø were available for help and questions while the natural helpers and callers worked on the scenarios. Paintsill also acted as host for the callers at PMV and interviewed them after the calls. Aambø was with the callers when they made the calls.

First, the callers arrived at PMV, met with Paintsill, Aambø, and Gerwing. They then met with the members of their immigrant group together in a room with the natural helper for that group. The callers chose a pseudonym that they could use during the call and instead of their own names in our database. They also chose a fake address. The natural helpers then guided the callers in deciding which scenario each would like to act out, starting with asking whether any in

the group had had a similar experience to one of the AMK scenarios. If yes, that person could do that scenario, if he or she were comfortable with enacting it. The other callers could construct a scenario from their own (or a friend or family member's) experience. The most important consideration was that each caller felt comfortable with having to enact his or her scenario. Approximately half the callers used scenarios provided by Ølberg, the other half used scenarios based on their own experiences. Note that discussions about the details of each scenario were held in the callers' mother tongue; that is, the callers were not provided with any Norwegian or English vocabulary related to their scenarios, nor were they coached on the best way to describe the scenario to the operator.

Next, the callers had lunch (provided by PMV) while Gerwing made a schedule and detailed timetable for the callers, including pseudonyms and the scenario each would use for the call. Meanwhile, the AMK operators arrived in Bergen, had lunch at Kokom, and made themselves ready for the calls.

For each of the calls, Gerwing directed the caller and the natural helper into an office, where Aambø was waiting. Aambø went over the consent form with the caller while the natural helper acted as interpreter. The caller had an opportunity to ask questions and ensure that he or she understood the activities. The caller and natural helper had one last opportunity to review the scenario, and when the caller was ready, he or she made the call to the simulation centre. The operators received the calls. After the first call, Kokom suggested that callers use their own name. However, after two callers used their own name and reported feeling uncomfortable afterwards, we discontinued that procedure. Note that the scenario for one call involved the caller finding a man on the street and then having to describe her location to the operator. For this call, the caller was taken by taxi to the location and she used a mobile to call Kokom from there.

When each call was finished, Gerwing met the caller and natural helper and directed them to another office, where Paintsill was waiting. Paintsill went over a "permission to listen" form with the natural helper and caller. On this form, the caller could indicate whether we could use the call for analysis and/or for examples in text and in presentations. Once the caller indicated his or her level of permission on the form, Paintsill interviewed the caller, with the natural helper acting as interpreter. During the interview, Gerwing photocopied the caller's consent and permission to listen forms, handed them back to Paintsill, and then collected the next caller, who would begin the next call while the previous caller was being interviewed. Meanwhile, at Kokom, Ølberg or Jensen interviewed the operator who had taken the call.

Once the interview was complete, the caller was free to leave PMV. The callers were asked not to discuss their experience of the call with other callers before they did their own call, but they were free to discuss them with callers who were also finished.

The following tables summarize the simulated sources material, including the order of calls, the pseudonyms the callers chose, the scenario, and the immigrant group from which the caller was a member.

Summary tables of calls

Calls on Oct 8:

order	caller (pseudonym)	Scenario	Group
1	Mina	adult with asthma, breathing problems	Arab
2	Sara	Contractions	Arab
3	Nazia	Contractions	Pakistani
4	Nada	fainted person	Arab
5	najiba	husband has epileptic fit	Pakistani
6	Ilham	unable to speak, cannot stand up	Arab
7	Jasmin	burned child	Pakistani
8	Chadia	heart problem	Arab
9	Tahirah	contractions	Pakistani
10	Shaima	child with fever cramps	Arab
11	Saima	child with breathing difficulties	Pakistani
12	Meriam	child drunk some detergent	Arab
13	Nora	child with electric shock	Arab
14	Ahlan	child has accident	Arab
15	Warda	child has a fit, scared of genie	Arab

Calls on November 20

1	James	child burned by boiling water	Nigeria
2	Dede	child with breathing problems	Ghana
3	Tetty	friend fell at opera house	Ghana
4	Margaret	man on sidewalk with chest pain	Sierra Leone
5	Nkwele	baby fell on steps	Cameroon
6	Paola	daughter fell in the shower	Cameroon
7	Muna	son with broken arm (Ali)	Somalia
8	Somaya	daughter with epilepsy	Somalia
9	Leyla	son with symptoms of influenza	Somalia
10	Shakira	daughter having breathing problems	Somalia

Appendix B: Inventory of examples used the report

Example title	Source
Listening example 1: Use of word that does not exist	Simulated call: AMIS 403
Listening example 2: Use of wrong grammar	Actual call: Track 07
Listening example 3: Wrong pronunciation	Actual call: Track 01
Listening example 4: Strong accent	Simulated call: AMIS 428
Listening example 5: Mixing languages	Simulated call: AMIS 429
Listening example 6: Making clear what is not understood	Actual call: Track 05
Grounding example 1: Grounding explicitly by repeating information	Simulated call: AMIS 404
Grounding example 2: Grounding explicitly by paraphrasing information	Actual call: Track 03
Grounding example 3: Grounding explicitly by repeating and paraphrasing information	Simulated call: AMIS 404
Grounding example 4: Taking extra time to ground explicitly	Simulated call: AMIS 428
Grounding example 5: Caller grounding implicitly	Simulated call: AMIS 402
Grounding example 6: Eliciting explicit grounding from caller	Simulated call: AMIS 409
Grounding example 7: False grounding	Actual call: Track 09
Adjusting example 1: General introduction	Simulated call: AMIS 404
Adjusting example 2: Adjusting articulation	Simulated call: AMIS 409
Adjusting example 3: Figuring out what vocabulary is not working	Actual call: Track 08
Adjusting example 4: Adjusting vocabulary	Simulated call: AMIS 400
Adjusting example 5: Instruction formulated as a question	Simulated call: AMIS 400
Adjusting example 6: Confusion from not asking a question directly	Simulated call: AMIS 402
Adjusting example 7: Negatively formulated question	Actual call: Track 09
Adjusting example 8: Two questions in one utterance	Simulated call: AMIS 403
Adjusting example 9: Too much information too quickly	Simulated call: AMIS 407
Providing information example 1: The medical emergency system	Actual call: Track 03
Providing information example 2: Alternatives to an ambulance	Simulated call: 403
Providing information example 3: The role of the AMK operator	Actual call: Track 04
Providing information example 4: The location of the ambulance	Actual call: Track 04
Providing information example 5: Saying that the ambulance has been sent	Actual call: Track 01
Providing information example 6: Unaccounted for silence	Actual call: Track 08
Providing information example 7: The urgency of instructions	Simulated call: AMIS 409
Providing information example 8: The patient's condition	Actual call: Track 04
Providing information example 9: Positive feedback about the caller's cooperation	Actual call: Track 04
Conflict example 1: Reassuring the caller that the request for an ambulance was heard	Actual call: Track 03
Conflict example 2: Telling the caller that help is on the way	Actual call: Track 01
Conflict example 3: The danger of ignoring what is not understood	Actual call: Track 02
Conflict example 4: Ignoring evidence that the caller has not understood	Actual call: Track 04
Conflict example 5: Instructing the caller to calm down	Actual call: Track 03
Conflict example 6: Accusing the caller	Actual call: Track 03
Conflict example 7: Implying that help is conditional	Actual call: Track 04