

Communication between general practitioners and the emergency medical dispatch centre in urgent cases

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ABSTRACT

INTRODUCTION: When general practitioners (GPs) order an ambulance, their calls are handled by staff at the emergency medical dispatch centre (EMDC) who then select an appropriate response. There are currently no data evaluating this mode of communication between the GPs and the staff at the EMDC.

METHODS: A retrospective study was performed based on evaluation of calls during which GPs requested a rapid response ambulance. Over a period of three months of 2014, 1,334 calls were included for evaluation according to specific parameters including a transactional analysis of the communication.

RESULTS: We found problematic communication in less than 2% (n = 25) of the evaluated calls. In 68% of the 25 problematic cases transactional analysis showed that the staff at the EMDC initiated the problematic communication. In 4% (n = 51) of the calls, the GP delegated the call to a secretary or nurse, and we found that these calls were more likely to contain problematic communication (odds ratio = 5.1). In 18% (n = 236) of the cases, there was not sufficient information to assess if the physician-manned mobile emergency care unit (MECU) should have been dispatched along with the ambulance.

CONCLUSIONS: Problematic communication is rare, occurring in less than 2% of the calls. Problems are more frequent when the GP delegates the call. Furthermore, we established that the communicative problems were more likely to be initiated by the staff at the EMDC than by the GP. In addition, we found that there was insufficient information to assess if the MECU should be dispatched in nearly 20% of all calls.

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TRIAL REGISTRATION: The study was approved by the Danish Data Protection Agency (ref. no. 2008-58-0035). Informed consent from individual patients or ethics committee approval was not required since it was a register-based study solely and no person-identifiable data were used.

The emergency medical dispatch system in Denmark is activated by dialling 1-1-2. By dialling this number, emergency assistance from the fire department, the police or the emergency medical services is obtained. In case citizens in Denmark are in need of sudden medical attention, they may also call their general practitioner (GP). Out-of-hours, patients may contact a re-

gional call centre which, in the Region of Southern Denmark, is manned by GPs. The GP answering the call may either arrange an acute visit by a GP, ask the patients to attend an out-of-hours facility, or give advice or issue a prescription by phone. If the GP considers that the urgency of a given incident exceeds the capabilities of the system comprised by the GPs, the answering GP can order an ambulance directly from the emergency medical dispatch centre (EMDC). A technical dispatcher answers the call, and if the GP orders an ambulance without siren, one will be dispatched. If the GP proposes a rapid response, the technical dispatcher redirects the call to the medical dispatch staff at the EMDC. The staff at the EMDC selects an appropriate response, determined by using the Danish Index for Emergency Care (DI) which was implemented nationwide in Denmark in 2011 [1-3].

An audit study from 2014 by Andersen et al showed a low incidence of fatal adverse outcomes when this emergency medical dispatch protocol was adhered to [4]. However, a recently published study found that medical problems that were perceived by the EMDC as “unclear problems” were associated with higher mortality in cases where a rapid response was not effectuated [5]. Therefore, there is some evidence that in order for the patient to receive the best possible pre-hospital care and to ensure optimal use of resources, it is important that the communication between the caller and the staff at the dispatch centre is effective and constructive.

The primary aim of our study was to evaluate the communication between the GP requesting a rapid ambulance response and the staff at the EMDC in the Region of Southern Denmark. Secondly, we wanted to evaluate the calls according to tentative diagnosis and to assess if there was sufficient information about the patient's condition to dispatch the relevant response according to DI.

METHODS

Study setting

The Region of Southern Denmark (population approximately 1.2 million people and an area of 12,000 km² [6]) is serviced by one EMDC. The EMDC receives all emergency calls from the citizens and also handles calls from the GPs requesting ambulances.

ORIGINAL ARTICLE

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 **TABLE 1**

Analysis and evaluation of calls to the emergency medical dispatch centre.

Does the GP make the call to the EMDC or is it delegated to e.g. a secretary or nurse?
Name of the GP?
Tentative diagnosis made by the GP?
Does the GP demand a rapid response?
Does the GP demand the MECU?
Is the patient's condition described well enough for the staff at the EMDC to decide accurate response? ^a
Is the patient's condition described well enough for the staff at EMDC to decide if the MECU should be dispatched? ^a
Has the GP seen the patient or not?

a) according to the Danish index for emergency care.

EMDC = emergency medical dispatch centre; GP = general practitioner; MECU = mobile emergency care unit.

The medical staff at EMDC consists of healthcare professionals (nurses, emergency medical technicians and paramedics) who have received supplementary education including training of their communicative skills and supervised introduction. The staff at the EMDC selects an appropriate response, determined by using the DI. The DI is a criteria-based dispatch protocol based on 37 main symptoms, and the response is subdivided into five levels from a rapid response ambulance with sirens and possibly extra resources such as a mobile emergency care unit (MECU) or helicopter emergency service (HEMS) unit, scaling down to no ambulance response because the patient can go by taxi or be transported by his or her own means.

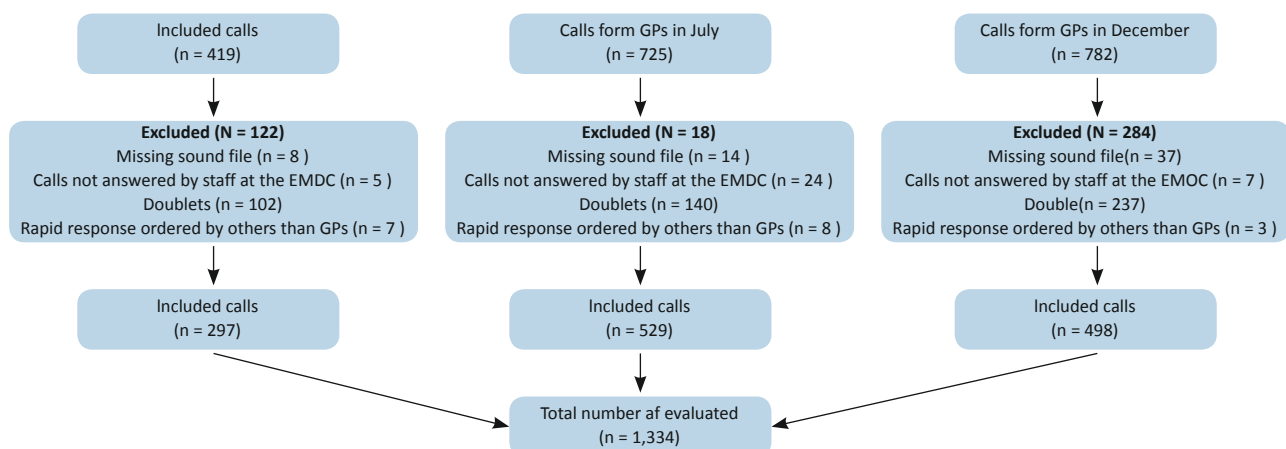
We conducted a retrospective study based on evaluation of calls where GPs requested a rapid response ambulance. Voice files were extracted from the database containing all incoming calls to the EMDC in the Region of Southern Denmark during three representative months of 2014; January, July and December.

To evaluate the communication, we used a model for transactional analysis as proposed by Eric Berne [7]. According to this theory, an individual's personality may consist of three ego states – adult, parent and child. Simple transactional analysis involves identifying which ego state the participants in a conversation adopt [8]. The communication can become problematic when one part feels that the other is being condescending, e.g. one takes on the role of a parent and the other a child as opposed to adult-to-adult conversation. In these cases, the communication is uneven and this is a “crossed transaction” according to Eric Berne's terminology [8]. We used this approach to analyse the conversations between the GPs and the staff at the EMDC. We identified conversations with suspicion of crossed transaction, and two authors independently evaluated these calls and calls with insufficient information according to our secondary effect parameters. The calls were also evaluated for other predefined parameters as presented in **Table 1**.

Data were exported to the online medical calculator Medcalc, where descriptive statistics and odds ratios (OR) on calls with crossed communication were performed [9]. p-values below 0.05 were considered significant.

 **FIGURE 1**

Flow chart illustrating included and excluded calls.



Doublets: ambulance missions where additional resources were sent; EMDC = emergency medical dispatch centre; GP = general practitioner.

Trial registration: The study was approved by the Danish Data Protection Agency (ref. no. 2008-58-0035). Consent from individual patients or ethics committee approval was not required since this was a register-based study solely, and no person identifiable data were used.

RESULTS

A total of 1,926 calls were assessed, and 1,334 calls were included for further evaluation. Each dispatch of an ambulance is registered with an ID number. Doublet calls, where the ID number was the same for two or more calls, indicating dispatch of ambulances and additional resources, e.g., MECU or HEMS, were excluded. This ensured that each call to the EMDC was analysed only once (Figure 1).

We found conversations with crossed transactions in less than 2% ($n = 25$) of the evaluated calls. In two thirds (68%) of these 25 cases, transactional analysis showed that the staff at the EMDC initiated the crossed transaction by adapting the parent ego state. The calls with crossed communication did not relate to specific GPs. In 4% ($n = 51$) of all the calls, the GP had delegated the call to a secretary or nurse. These calls were more likely to result in crossed transaction (OR = 5.1; $p < 0.05$) (Table 2).

In 18% ($n = 236$) of all evaluated calls, there was not sufficient information to assess whether the case fulfilled the criteria described in the DI [3] to require dispatch of the MECU along with the ambulance. Of these 236 cases, the GP did not have the information needed to assess this in 28% of cases. In 72% of cases, the staff at the EMDC did not ask enough relevant questions. In less than 1% ($n = 13$) of all calls, the GP demanded a rapid response without the patient's condition warranting this according to the criteria in the DI. In nearly 2% ($n = 21$) of the calls, the GP demanded MECU assistance without the patient's condition fulfilling the criteria. The most common tentative diagnoses were acute coronary syndrome accounting for 64% of all the calls followed by other cardio-pulmonary diseases (10%) (Figure 2). In 78% ($n = 1,041$) of the calls, the GP had not actually seen the patient.

DISCUSSION

Overall, this study shows that the communication between the GPs and the staff at the EMDC was, in general, constructive and professional with communicative problems being a rare occurrence. We found that calls where the GP delegated the task of making the call, e.g. to a secretary or a nurse, were much more likely to result in crossed transaction and thereby be categorised as a problematic conversation. Our study reveals that in the rare situations where problematic communication occurs, the problem most often originates with the staff

TABLE 2

Communication problems between staff at the emergency medical dispatch centre and general practitioners. Odds ratio of problematic communication when calls are delegated to staff by general practitioners.

Substitute caller/GP, n		Odds ratio (95% CI)	p-value
all evaluated calls	communication problems		
21/1,262	4/47	5.1 (1.7-15.5)	0.004

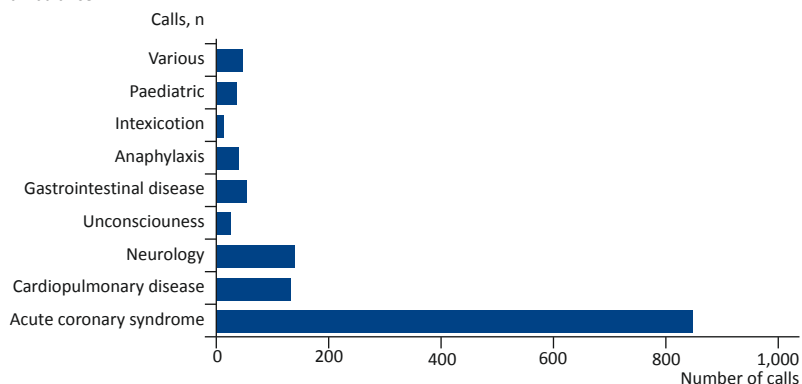
CI = confidence interval; GP = general practitioner.

at the EMDC. When a GP requests a rapid response, one could argue that the dynamic in the decision-making is shifted and the staff at the EMDC do "as the doctor ordered" and thereby in some cases disregard the DI. In cases where the GP delegates making the call, this dynamic is again changed. We discovered that in the conversations that had been delegated, the secretary or nurse was not always sufficiently informed about the patient's condition, resulting in inadequate triage of the patient according to the protocol. When dealing with patients with potentially life-threatening conditions, it is always important to ensure optimal allocation of the resources at hand, and this may be the underlying reason why a GP decides to delegate making the call to the EMDC and request a rapid response on his or her behalf. However, in only one case out of the 51 did the conversation show that the patient's condition was so serious that the GP could not make the call him/herself.

In the EMDC, the decision-making regarding the urgency of the response, the allocation of ambulances and/or MECU and HEMS is a dynamic process, and the staff is instructed in using the DI in their decision-making [2]. In the present study, we found that in 18% of all calls, there was insufficient information about the pa-

FIGURE 2

Tentative diagnostic categories suggested by general practitioners when requesting a rapid response ambulance.



tient's condition to assess if the MECU should be dispatched. In the majority of these cases, inadequate questioning from the staff at the EMDC resulted in a potential risk of over- and under-triaging. The evidence in this area is diverging, and the large heterogeneity of dispatch systems and pre-hospital emergency systems across the globe makes it difficult to generalise internationally. A systematic review from 2015 by McQueen et al concluded that there is a lack of evidence supporting the role of primary dispatch models in targeting the deployment of enhanced resources to patients with severe injuries as opposed to secondary dispatch following requests from emergency medical staff at the scene [10]. In an Italian study from 2014, telephone conversations were analysed to detect factors associated with under-triage. That study found that in cases with under-triage, the callers had been interrogated inadequately, and furthermore the operators had failed to document all elements of the dispatch form when interviewing the caller. Vital signs had been only partially assessed and in some cases entirely neglected [11]. In our study, the caller was a GP and this is different from the other studies where the caller was a layperson. In 78% of the cases, however, the GP had not actually seen the patient, which potentially reduces the information necessary for the EMDC to dispatch the correct resource. The most frequent tentative diagnosis assigned by the GPs was acute coronary syndrome; in Denmark, this diagnosis warrants a rapid response. This may explain the high number of cases where the GP did not actually see the patient, but requested a rapid response.

The dispatchers' use of a predefined index for prioritising emergency ambulance missions has been investigated in a Norwegian study, reporting a wide range in self-reported use of the index. The mean use of such an index was approximately 75% of the calls [12]. Another Norwegian study found that the mean overall guideline adherence for acute and urgent emergency calls was 80% and that low guideline adherence delayed the ambulance dispatch. However, in these studies, the callers were laypersons and not GPs.

Further audit studies on dispatch guideline adherence in the Danish dispatch centres should be undertaken to assess this problem. Regular training may help the staff at the EMDC apply the dispatch protocol more strictly, even when the caller requesting a rapid response is a doctor.

STRENGTHS AND LIMITATIONS

One notable strength of our study is its generalisability to other Nordic countries. The DI is a translation of the Norwegian Index for Medical Emergency Assistance adapted to the Danish pre-hospital setting. As the Scandinavian emergency medical systems are comparable [2,

13], we believe that our results are generalisable to both the rest of the Danish and particularly to the Norwegian setting, but also to the other Scandinavian emergency medical systems. The study is retrospective. This we consider a strength as the nature of this study is thus free of any Hawthorne effect [14].

Our study has several limitations. As the study is a single-centre study, there is a risk that our results only represent the cultural behaviour of one workplace and its particular environment and setting. Furthermore, the method by which we analysed the communication is based on a subjective interpretation of the conversations. Not all calls were listened to by two authors independently. This could potentially have introduced bias. However, all dubious cases and all conversations with crossed transactions were analysed by two authors independently. The inclusion time covered the year of 2014 from which January, July and December were selected as representative months. The procedure required for the GPs to request an ambulance was implemented as from 11 January, and therefore the number of calls in that month were fewer than in July and December (Figure 1). Furthermore, in March 2014, there was an incident where a patient died due to unrecognised heart failure only a few hours after having contacted the out-of-hours medical services. The following months after this incident were not representative since calls to the out-of-hours medical service, and hence the dispatch central, were much more frequent during this period. This effect eventually subsided, and July and December were very similar to both each other and the months before the incident occurred in regard to number of calls per month. The tentative diagnosis acute coronary syndrome was suggested in 40% of the calls in January and December and 50% of the calls in July. However, choosing only three months could have introduced selection bias.

CONCLUSIONS

This study found that problematic communication between the GPs requesting a rapid response and the staff at the EMDC is rare, occurring in less than 2% of all calls. We found that problems were much more likely to occur if the GP delegated the call to another person, e.g. a secretary or a nurse. By analysing the conversations, we found that the staff at the EMDC most often initiated problematic communication. In addition, we found that in nearly 20% of all calls there was insufficient information to assess if the MECU should be dispatched or not; this was mainly because of inadequate questioning from the staff at the EMDC.

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LITERATURE

1. Andersen MS, Carlsen HP, Christensen EF. Criteria-based emergency medical dispatch of ambulances fulfils goals. *Dan Med Bull* 2011;58(12):A4336.
2. Andersen MS, Johnsen SP, Sorensen JN et al. Implementing a nationwide criteria-based emergency medical dispatch system: a register-based follow-up study. *Scand J Trauma Resusc Emerg Med* 2013;21:53.
3. Dansk Index for Akuthjælp – AMK – vagtcentralernes værktøj for visitation til præhospitale ressourcer. Region Syddanmark, version 1.5. Laerdal Foundation, ed. 2014.
4. Andersen MS, Johnsen SP, Hansen AE et al. Preventable deaths following emergency medical dispatch—an audit study. *Scand J Trauma Resusc Emerg Med* 2014;22:74.
5. Moller TP, Kjaerulff TM, Viereck S, et al. The difficult medical emergency call: a register-based study of predictors and outcomes. *Scand J Trauma Resusc Emerg Med* 2017;25:22.
6. Information on the five danish regions. www.regioner.dk/services/om-fem-regioner (11 Feb 2017).
7. Berne E. Transactional analysis in psychotherapy; a systematic individual and social psychiatry. New York: Grove Press, 1961:270.
8. Berne E. Creator of transactional analysis and author of games people play. www.ericberne.com/transactional-analysis (11 Feb 2017).
9. Medcalculator. https://www.medcalc.org/calc/odds_ratio.php (11 Feb 2017).
10. McQueen C, Smyth M, Fisher J et al. Does the use of dedicated dispatch criteria by Emergency Medical Services optimise appropriate allocation of advanced care resources in cases of high severity trauma? *Injury* 2015;46:1197-206.
11. Palma E, Antonaci D, Coli A et al. Analysis of emergency medical services triage and dispatch errors by registered nurses in Italy. *J Emerg Nurs* 2014;40:476-83.
12. Ellensen EN, Hunnskaar S, Wisborg T et al. Variations in contact patterns and dispatch guideline adherence between Norwegian emergency medical communication centres – a cross-sectional study. *Scand J Trauma Resusc Emerg Med* 2014;22:2.
13. Kruger AJ, Lossius HM, Mikkelsen S et al. Pre-hospital critical care by anaesthesiologist-staffed pre-hospital services in Scandinavia: a prospective population-based study. *Acta Anaesthesiol Scand* 2013;57:1175-85.
14. Holden JD. Hawthorne effects and research into professional practice. *J Eval Clin Pract* 2001;7:65-70.