Clinical question.
In adult and pediatric patients with OHCA (P), does the description of any specific symptoms to the dispatcher (I) compared with the absence of any specific description (C), improve accuracy of the diagnosis of cardiac arrest?

State if this is a proposed new topic or revision of existing worksheet: This worksheet is new

Search strategy (including electronic databases searched).

- the Cochrane Library N=0
- Pubmed
"Heart Arrest"[Mesh] AND ("heart arrest"[MeSH Terms] OR ("heart"[All Fields] AND "arrest"[All Fields]) OR "heart arrest"[All Fields] OR ("cardiac"[All Fields] AND "arrest"[All Fields]) OR "cardiac arrest"[All Fields]) AND ("diagnosis"[Subheading] OR "diagnosis"[All Fields] OR "symptoms"[All Fields]) AND ("emergencies"[MeSH Terms] OR "emergencies"[All Fields] OR "emergency"[All Fields]) AND calls[All Fields]) N=45, suitable abstracts N = 10

Hand picked from PubMed from Related articles N= 1

- EMBASE
  - N= 41, suitable abstracts N =21

All searches were repeated 25.9.2009

State inclusion and exclusion criteria
Inclusion: only human, adult or pediatric cardiac arrest outside the hospital, reporting the diagnosing of cardiac arrest

Exclusion: animal studies, comments or letters or editorials or only abstracts

Number of articles/sources meeting criteria for further review: 86 abstracts were included to begin with, 32 articles were reviewed in depth, 12 articles were used to formulate this worksheet
## Summary of evidence

### Evidence Supporting Clinical Question

The questions in the protocol are valid (is the patient awake, is he breathing normally) or question of history of previous epilepsy

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<thead>
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<tbody>
<tr>
<td>Poor</td>
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<td>D1</td>
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<tr>
<td>D5</td>
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</tbody>
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**Level of evidence**

A = Return of spontaneous circulation  
B = Survival of event  
C = Survival to hospital discharge  
D = Intact neurological survival  
E = Correct identification of CA  

*Italics = Animal studies*
### Evidence Neutral to Clinical question

<table>
<thead>
<tr>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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|               |                           | Flynn J, 2006, 72 E  
|               |                           | Kuisma M, 2005, 89 E  
|               |                           | Ma H, 2007, 236 E  |

<table>
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### Evidence Opposing Clinical Question

Following the protocol is not giving better results

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*Italics = Animal studies*
REVIEWER’S FINAL COMMENTS AND ASSESSMENT OF BENEFIT / RISK:

The question: In adult and pediatric patients with OHCA (P), does the description of any specific symptoms to the dispatcher (I) compared with the absence of any specific description (C), improve accuracy of the diagnosis of cardiac arrest?

The studies presented the questions as a protocol. The protocol included questions: is the patient awake, is he breathing normally? There were no randomized studies that would answer the PICO. Some studies looked at other symptoms, but not in a conclusive way. Agonal breathing seemed to be a factor that made identification of CA difficult.

I found no systematic review or meta-analysis, and no randomized controlled trials on this topic. I have identified a total of 12 manuscripts. Here is highlighted the supporting ones.


Cardiac arrest detection was 71%. Survival was better if the cardiac arrest was recognized. Normal breathing was never described in patients with a cardiac arrest. If the dispatchers would have treated all unconscious patients with abnormal breathing, all CAs would have been recognized.

<table>
<thead>
<tr>
<th>Cardiac arrest</th>
<th>Present</th>
<th>Absent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspected</td>
<td>203</td>
<td>64</td>
<td>267</td>
</tr>
<tr>
<td>Not suspected</td>
<td>82</td>
<td>9230</td>
<td>9312</td>
</tr>
<tr>
<td>Total</td>
<td>285</td>
<td>9294</td>
<td>9579</td>
</tr>
<tr>
<td>Specificity</td>
<td></td>
<td>0.993</td>
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</tr>
<tr>
<td>Sensitivity</td>
<td></td>
<td>0.71</td>
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**Clawson, J. 2007, 298, LOE D2.** "Cardiac arrest predictability in seizure patients based on emergency medical dispatcher identification of previous seizure or epilepsy history." Resuscitation 75(2): 298-304.

Two versions of the MPDSs were compared. A new question about breathing regularity was included in the seizure protocol. Protocol compliance was 98.5% Lack of seizure history should significantly increase the possibility of the seizure described to be anoxic and due to sudden cardiac arrest.


All CA calls for three months (N= 566) were analyzed, altogether 52 895 calls. Compliance to protocol 95%

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<tbody>
<tr>
<td>Suspected</td>
<td>566</td>
<td>403</td>
<td>969</td>
</tr>
<tr>
<td>Not suspected</td>
<td>172</td>
<td>51754</td>
<td>51926</td>
</tr>
<tr>
<td>Total</td>
<td>738</td>
<td>52157</td>
<td>52895</td>
</tr>
<tr>
<td>Specificity</td>
<td></td>
<td>0.992</td>
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</tr>
<tr>
<td>Sensitivity</td>
<td></td>
<td>0.77</td>
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**Heward, A. 2004, 115, LOE 3D.** "Does the use of the Advanced Medical Priority Dispatch System affect cardiac arrest detection?" Emerg Med J 21(1): 115-8. Compared data before and after MPDS implementation. Cardiac arrest detection 1999 was 15%. AMPDS in 2001, detection was 50%. Protocol compliance was 95%.


Analyzed 776 calls. From the questions asked only three gave better identification (Bayesian analysis). Protocol and if the patient has seizures were valid. Circulation and skin questions were not valid. Protocol compliance only 52.4% but correct identification of CA 83%.
Citation List


Comments: An 8-month study with 14 800 emergency calls. Prevalence of cardiac arrest was 3%. Only calls by laypersons were included and only patients that ALS was initiated on were included. Calls were classified as suspected CA if two ambulances were dispatched. The dispatchers correctly identified 71%. In half of the missed cases the dispatcher did not ask about breathing. In 203 calls CA was suspected and present, in 64 it was suspected but not present and in 82, CA was not suspected but present. The survival rate was better if the CA was recognized. Normal breathing was never described in patients in CA. Abnormal breathing was described in 40% and the prevalence in those patients was 32%. The description of patient being dead had the highest off for CA. If the dispatchers would have treated all unconscious patients with abnormal breathing, all CAs would have been recognized. LOE D2, good.


Comments: Looked at 181 incidents, 161 were confirmed OHCA, and 9 more which could not be excluded as OHCA and compared these to a complete set of emergency events at the same time period. Found that from 27 VF cases only 12 got initial dispatch as CA and of 17 witnessed only 8. The conclusion was that this system is moderate in its accuracy. LOE D4, fair.


Comments: A prospective study of all CA calls of one year N=328. The protocol was obeyed by dispatchers in 42% of the calls made by professionals and in 65% if the caller was a layperson. The identification was slightly better when there was more information about breathing and consciousness. LOE D4, fair.


Comments: Identification of a previous history of seizures or epilepsy predicts that any given seizure would be another of the same type. Lack of such history should significantly increase the possibility of anoxic sudden cardiac arrest. LOE D4, fair.

Comments: Protocol compliance during the study 98.5%. When reporting seizure, asking about normal breathing increased recognition of CA. LOE D3, good.


Comments: All CA calls for three months (N= 566) were analyzed, altogether 52 895 calls. Compliance to protocol 95%. Correctly identified 76.6%, 99.2% of non-cardiac arrests were not dispatched. The protocol seems to have the right questions for detection of CA. LOE D4, fair.


Comments: Tel-CPR. Failure to follow protocol in 69% of those not correctly identified. LOE D4, fair.


Comments: After implementation of a protocol the identification of CAs have increased from 15% to 50%. The better the compliance to the protocol, the better identification rate. LOE D3, fair.


Comments: Looks at CA calls for one year. Does not address the questions but gives numbers on identification. CA was recognized in 79.4%. In 20.6% the patient was found in CA by the EMS. Survival to discharge was 37.2% if CA correctly identified, and 28.6% if it was not. LOE D4, fair.


Comments: Key questions were 1. skin colour 2. symptom of airway obstruction 3. can CPR start 4. how long comatose. Later also stated the normal protocol questions. 199 CA suspected calls included, 4 patients were not in CA. Breathing was determined in 68%. Consciousness determined in 114/199. Sensitivity 96.9%, PPV 97.9%. Now information about the role of skin color. LOE D4, fair.


Comments: 776 calls with CA either suspected by the dispatcher or found on the scene by EMS were included. Dispatchers identified 83% correctly. Abnormal breathing was described in 39%. The identification rate rose if there was information about abnormal breathing or no breathing. Protocol compliance was higher in false positive and false negative calls than in correctly identified calls. LOE D4, fair.

**Comments:** The protocol included questions about awakeness and breathing normally. 108 of 192 cases were correctly identified and when agonal breathing was present only half of those cases were correctly identified. LOE D3, good.

**Not included:**


**Comments:** A descriptive study looking at 100 calls of cardiac arrest where the patients survived to hospital. Knowledge of abnormal or no breathing and not awake was sought for. Not breathing normally (N=38) included: breathing poorly, gasping, wheezing, occasional or impaired breathing. Twenty four of these patients were in respiratory arrest. The results were not looking at how good the identification of CA was if knowledge of these questions could be gathered. The study presumes that these questions in the protocol are valid. Not included.


**Comments:** The study does not actually say how well the asked questions helped identification. It studies the compliance to asking the questions in the protocol. It states that the protocol is very important. Not included.


**Comments:** Looks at a training program and how the protocol questions are followed before and after this training. Not included.


**Comments:** Looks only at calls (N= 313) were dispatching to OHCA, ½ of victims showed some signs of breathing and this makes identification of CA difficult because absence of breathing is one of the diagnostic criteria. Does not address how the question affected the identification of CA. LOE 4, poor. Not included.


**Comments:** Did not address the questions asked. Not included.

**Comments:** Looks at T-CPR. Does not address questions or identification. Not included.


**Comments:** Does not address questions or identification of CA: Agonal breathing common (50%) and described in many ways. LOE 4, fair. Not included.


**Comments:** No specific questions determined. Not included.


**Comments:** No actual questions. Not included.


**Comments:** Talks generally about agonal respiration. Do not address identification of cardiac arrest. Not included in the final recommendations.


**Comments:** The article is about T-CPR. Not included.


**Comments:** Does not address any specific questions. States that callers age over 50 and that caller is emotional is common in cardiac arrest calls. LOE 4, fair. Not included.


**Comments:** Compares MPDS with a prehospital triagesystem. Does not address any questions or identification of CA. Not included.

**Comments:** Studying calling parties. Did not address the questions asked. Not included.


**Comments:** Does not address CA identification. Not included.


**Comments:** Tel-CPR. Does not address the identification of CA. Not included.


**Comments:** Nothing about symptoms. Not included.


**Comments:** Did not address specific questions. Not included.


**Comments:** Analysis telephone-CPR. Not included.


**Comments:** Analysis telephone-CPR. Not included.