Author’s response to reviews

Title: The medical diagnosis as a linguistic game

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Dear editors,

the manuscript was thoroughly rewritten and a supplement was added with 4 exemplary disease entities, which explain how we used atomistic terms for constructing pathophemes.

Reviewer I

1. The first recommendation of better clarity was taken as the suggestion for rewriting large parts of the body. We diminished the number of examples and provide more details as proposed by reviewer II (point 1).

2. Following the recommendation of the reviewer 1 and 2 only 4 consistent patient cases were given as an example of the use of Memem7 demonstrating the fitting of a patient vector to its corresponding disease entities (pathosomes)
3. Example 1 (case 1) remained RAEB (refractory anemia with excess of blasts). The entity, however, was described by the symptoms and it was demonstrated how the systems handle the symptoms.

4. Example 2 (case 2) was added following the recommendations of reviewer I. (female, 55 years, breast lump, with firm texture.)

5. Example 3 (case 3): Meckel syndrome IV.

6. Example 4 (case 4) a patient suffering from proteinuria and hematuria.

7. Example 5 to 8 were excluded. Only 4 consistent examples were given in the publication instead of 8 in the original publication.

8. Above all in this context the impenetrable nature of the text makes the claim to a “holistic” approach sound hollow. The text was changed partly, making hopefully the message of the publication clearer. The term “holistic approach” means that each ICD-10 term could be integrated in memory. The whole sentence with the adjective “holistic” was excluded.

9. Note that "+++" is defined as "50% to 100%", and "++" as "10% to 50%". This is the kind of minor slip which undermines confidence.

“Lead” means that this pathophem is always present in a pathosom. “+++” means a frequency between 50% to 100%, “++” means a frequency of 10% to 49.9%, “+” 1% to 9.9% and “(+)” <1%. “NOT” means that a pathophem excludes a pathosom.
Reviewer 2:

1. “The text in general is too succinct. Giving more details on the proposed method and its implementation could improve the paper readability.” The text was partly rewritten and the examples (now patient cases as recommended by reviewer 1) were described more in detail.

2. “Related work should be described and compared with the proposed work, leaving clear its contribution to the state of the art.” We added a very recent publication (Müller T 2016) and compared the results of this publication with our data. 4 systems available with a similar intention than Memem7 were reported.

3. “The authors say that their system differs from others previously proposed, by using only linguistic elements, in contrast to probabilistic or Bayesian approaches. But they should compare their results with the results obtained with those approaches, to prove its effectiveness. Could, for example, the combination of linguistic information with statistical methods produce better and more reliable results?” There are different approaches for use of computer-technology in medical decision assistance (better CDSS) systems such as probabilistic, Bayesian approaches or machine learning systems. We add a system based on atomized linguistic terms. It may be possible to combine probabilistic and linguistic approaches. The advantage of a linguistic system is that atomized terms (pathophems) can be easily added to a disease by entity. The comparison is planned on basis of the next software version.

4. “I think that the participation of doctors in the process of evaluating the results is important. Considered as gold standard, they could qualify and validate the results.” Three of the authors are physicians currently using the system and validating the system (see point 5).

5. “To what extent the success rate obtained (about 47%) can be considered good or acceptable in a diagnostic context? This should be discussed.” The data available for
assessment of the sensitivity for clinical decision support system (CDSS) are sparse and difficile to compare. In one recent publication (Müller T et al 2016) a sensitivity of 96% was claimed, when case reports of the New England Journal of Medicine were used for the evaluation of the systems (DXplain, Isabel Healthcare). Our much less impressive data improve after each testing as each case not found in the first assessment add the lacking linguistic elements to pathosom not found.

6. “Why is not there a prototype of the system available? It would be an important tool for us to assess the system.” We know about the necessity of a working prototype and will permit limited access to the system soon.