Differential diagnostic algorithm for diseases manifested with heart murmurs syndrome

Kalp üfürümü sendromu ile beraber görülen hastalıklarda ayırıcı tanısal algoritma

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ABSTRACT

Diagnostic interpretation at auscultation of heart murmurs is accompanied by frequent errors. It creates serious clinical, pedagogical, organizational and social problems. The standard nosological principle of a clinical information description from the diagnosis (a disease name) to the description of symptoms/signs contradicts to real clinical practice from revealing of symptoms through differential diagnostics to a diagnosis establishment. The differential diagnostic algorithm or diagnostic algorithm developed by the author, is based on the opposite syndromic principle of thinking – from the signs to the diagnosis. It completely corresponds to the practical purposes of reliable diagnostics of 35 illnesses, manifested by heart murmurs at a heart auscultation. *(Anadolu Kardiyol Derg 2009; 9: 331-9)*

Key words: Heart murmurs, heart diseases, diagnosis, differential diagnostic algorithm, diagnostic errors

ÖZET

Kalp üfürümlerinin dinlemesinde tanıya yönelik yorumda birçok yanlış yapılmaktadır. Bu, ciddi klinik, pedagojik, organizasyon ve sosyal problemleri doğurur. Tanıdan (hastalık ismi) semptom/belirtilerin tanımlanmasına kadar, klinik bilgilerin standart tasnif prensipleri semptomların açıklanmasından ayırıcı tanı ve tanının kesinleştirilmesine kadar gerçek klinik uygulama ile çelişmektedir. Yazar tarafından geliştirilen ayırıcı tanısal algoritma veya tanısal algoritma, zıt düşüncenin sendromik prensibinin zıtlığına dayanır-bulgudan tanıya. Bu kavram tam olarak, kalp oskültasyonunda üfürümle kendini belli eden, 35 hastalığın gerçek tanılarına pratik yaklaşıma uymaktadır. *(Anadolu Kardiyol Derg 2009; 9: 331-9)*

Anahtar kelimeler: Kalp üfürümü, kalp hastalığı, teşhis, ayırıcı tanısal algoritma, tanısal hatalar

Dear reader, please, stop the further reading of the article. Familiarize with a condition of a diagnostic task, and on available symptoms/signs write down the diagnosis. Only after that, continue reading of the article.

Diagnostic task

The 23-year-old woman, with complaints for dyspnea exertional. At heart auscultation, the murmurs continuous are present in the pulmonic area with no interruption between the systolic and diastolic components. The detail characteristic of the murmurs is the following. The heart murmur systolic ejection second left interspace and heart murmur diastolic decrescendo second left interspace.

Please, write your diagnosis.

Introduction

This part of the article has been represents of the preamble to differential diagnostic algorithm (DDA) for diseases, manifested with heart murmurs.

This article represents a single whole with the author's article "Heart murmurs auscultation as professional learning problems" (2) and it is of its continuation. In mentioned article vast results of the comparative evaluation are presented at usual diagnostics and with application of diagnostic algorithm. In the five tables, totally 4749 written diagnoses were analyzed. At diagnostic interpretation of heart murmurs essential advantage of syndromic algorithmic thinking is established. A diagnostics with the algorithm has decreases of mistakes in times.

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Differential diagnostic algorithm for diseases, manifested with heart murmurs has intended for medical students and family doctors, general practitioners working in polyclinics. Such doctor has constant deficiency of a time during his work with patients. There are also financial and organizational restrictions in use of the advanced expensive diagnostic methods.

The algorithm presented below has created in view of these restrictions. Differential diagnostics on the first stages has carried out on the most accessible s/s and during the shortest time. More exact methods, mainly an echocardiography appears at last stages of diagnostic decision-making process.

In the beginning of the algorithm generalizing groups of diagnoses have presented. At the subsequent stages diagnoses detailed up to a final diagnosis of every disease.

What volume of sources for differential diagnostics of heart murmurs? In the word known manuals 8 (4), 11 (3), 20 (5), 23 diseases with heart murmurs (Learning Cardiac Auscultation CD-ROM Software) (6). The author's algorithm provides differential diagnostics of 35 illnesses, manifested by heart murmurs.

List of diseases, manifested with murmurs and included to DDA

1. Aortic regurgitation acute
2. Aortic valvular stenosis
3. Aortic regurgitation chronic
4. Mitral valve prolapse
5. Mitral regurgitation rheumatic
6. Patent ductus arteriosus
7. Hypertrophic subaortic stenosis
8. Tricuspid regurgitation
9. Atrial septal defect
10. Patent ductus arteriosus with right to left shunt
11. Mitral stenosis
12. Ventricular septal defect large
13. Angina pectoris
14. Angina variant (Prinzmetal's)
15. Crescendo angina
16. Rheumatic carditis acute
17. Endocarditis acute infective left heart
18. Endocarditis infective right heart
19. Endocarditis subacute infective left heart
20. Hypertensive heart disease
21. Pulmonary hypertension secondary
22. Thyrotoxic heart disease
23. Cardiomyopathy primary
24. Cardiomyopathy secondary
25. Hyperthyroidism (Graves disease)
26. Mitral regurgitation due to papillary muscle dysfunction
27. Atrial myxoma left
28. Atrial myxoma right
29. Primary pulmonary hypertension
30. Pulmonic valvular stenosis
31. Tetralogy of Fallot
32. Ruptured mitral papillary muscle
33. Ruptured mitral chordae tendineae
34. Tricuspid stenosis
35. Ventricular septal defect small

The image of the algorithm has placed on four pages. The double Arabic numerals have specified in places of continuation of the given branch on other page, for example, 4.1. In this case, it is necessary to pass to specified stage, where the same number, as on the previous page, designates continuation of this branch.

Instruction for work with diagnostic algorithm

This instruction is developed by the author as a result of special researches and long-term mass pedagogical experiments (1).

(The experimenter at mass experiment for comparative evaluation of traditional nosological and syndromic algorithmic diagnostics can use this text for examinees)

Now you will work up on yourselves for the first time the other syndromic algorithmic principle of clinical thinking. Before your eyes is the Differential Diagnostic Algorithm of diseases, which have manifested by murmurs in the field of heart.

First, the general review of the algorithm. Pay attention, that each stage of the algorithm has printed by larger font, has the serial number, and represents one concrete sign. From each sign, there is a branch with the symbols plus and minus that means presence or absence of the given sign. The plus and the minus are equivalent to words "yes, no".

New branches go away from each plus and minus. Here again three variants of the conclusions have been present. 1) The intermediate conclusions, which have no number and has written by the bold font. 2) The numbered list of diseases to which differential diagnostics is necessary at the subsequent stages of the algorithm. 3) The final diagnosis, which has written by the bold font and underline.

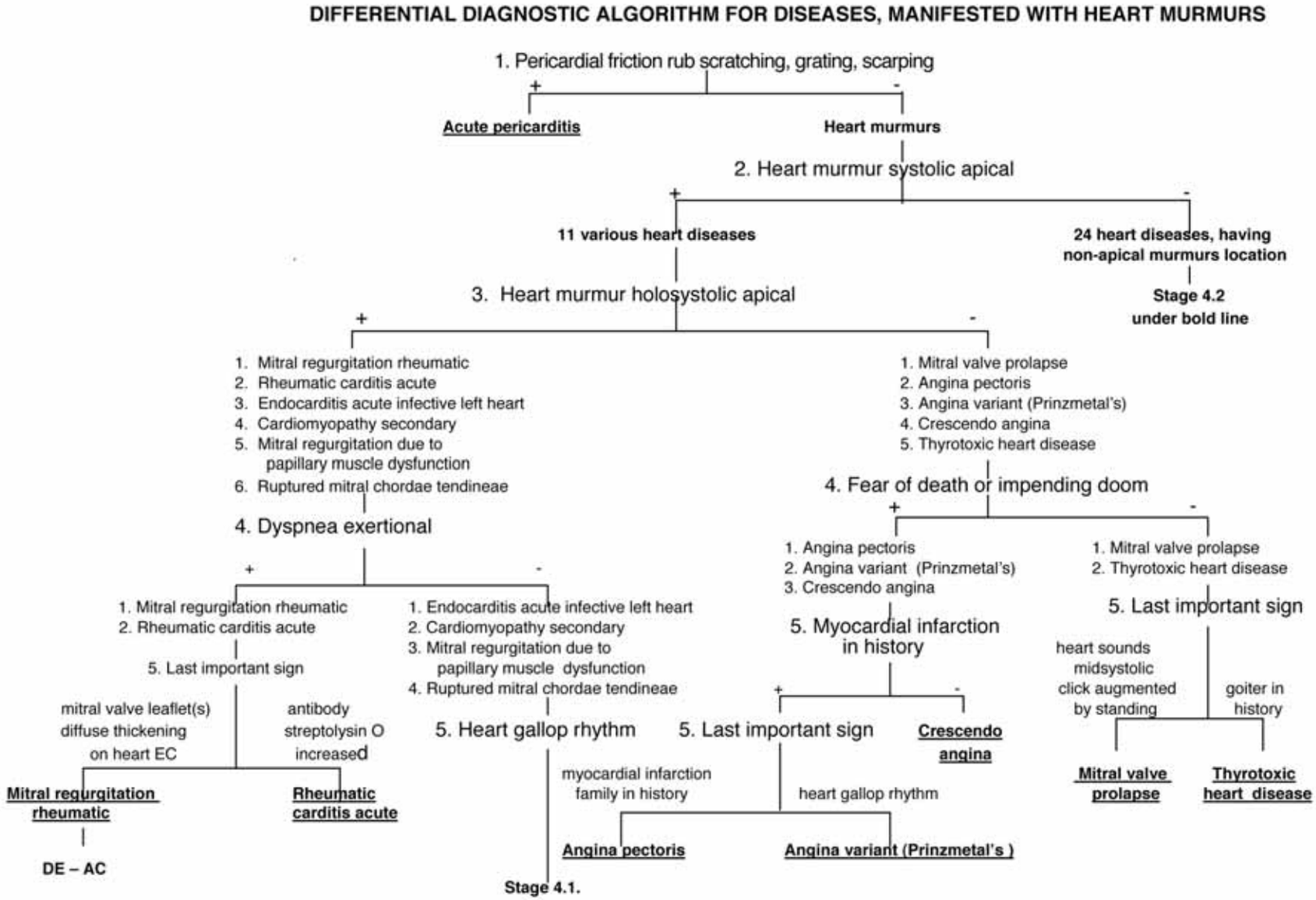
Pay attention to efficiency and economy algorithmic thinking. 35 diagnoses are established on the basis from 1 up to 10 signs, more often for the diagnosis there are enough only 4-6 signs. It allows to establishing diagnoses very quickly with minimal examinations, already at the first examination of the patient in a polyclinic. Special methods of examination - X-ray, electrocardiogram, etc. have used at the last stages of diagnostics.

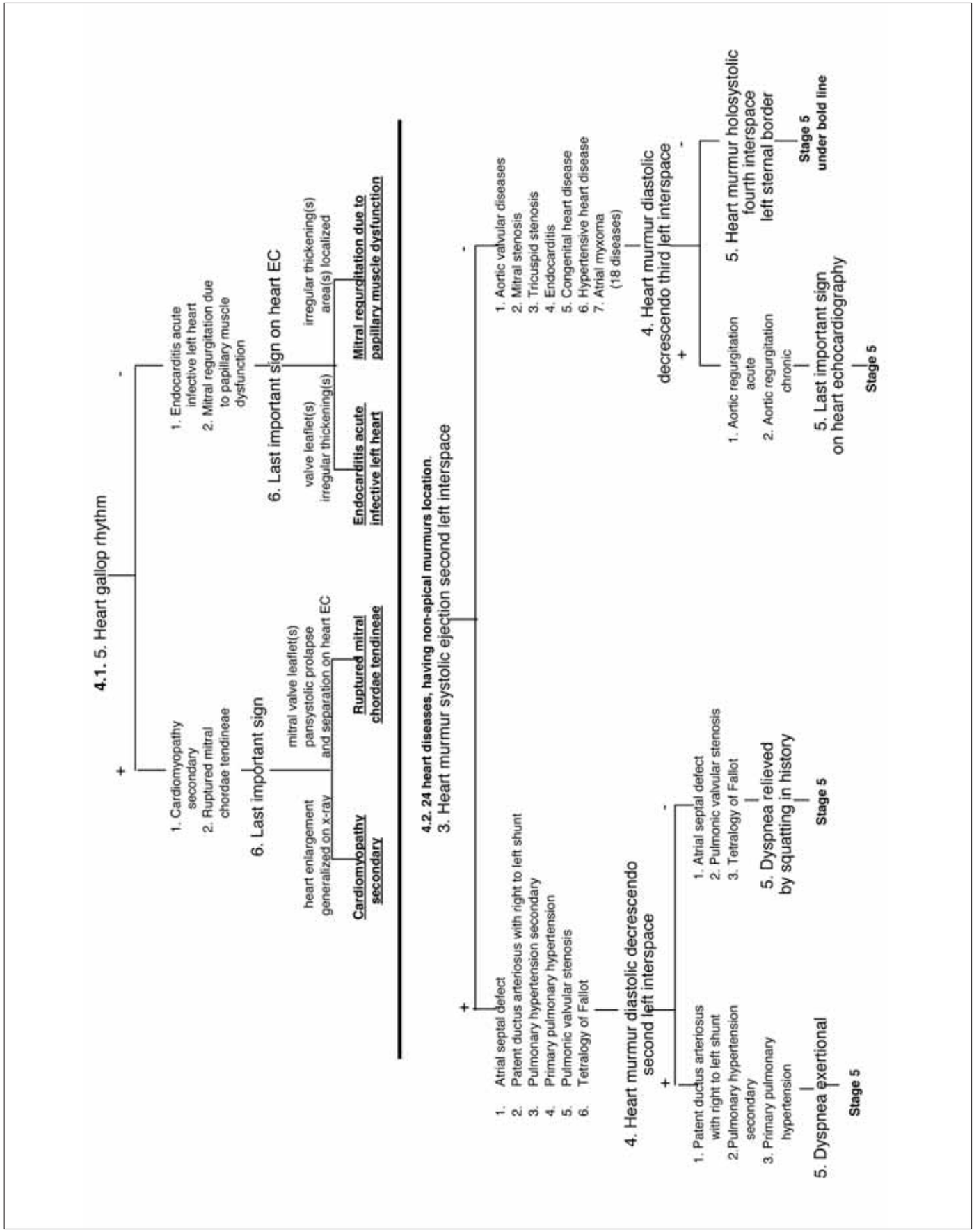
In most cases, the algorithmic diagnosis is the final diagnosis. However, in special cases, e.g., if surgical intervention on heart is required exact preoperative diagnosis is necessary. With this purpose under many diagnoses, the bold font specifies the abbreviated recommendations.

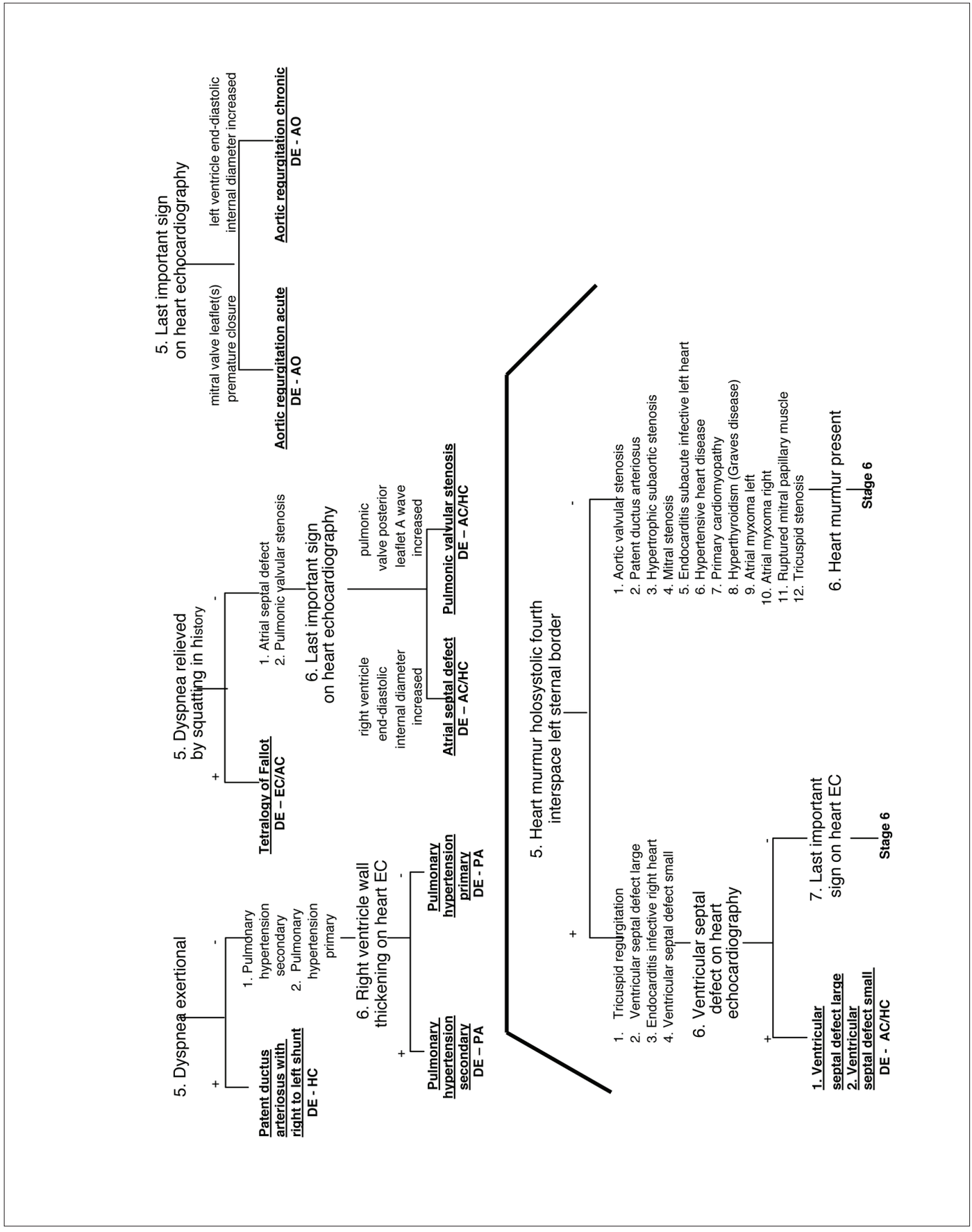
The expression "Last important sign" has frequently used here. It means, that the mentioned s/s allows establishing various final diagnoses. However, sometimes under established diagnoses the most reliable methods used, e.g. if a surgical intervention has been intended, and the most precise diagnosis is necessary.

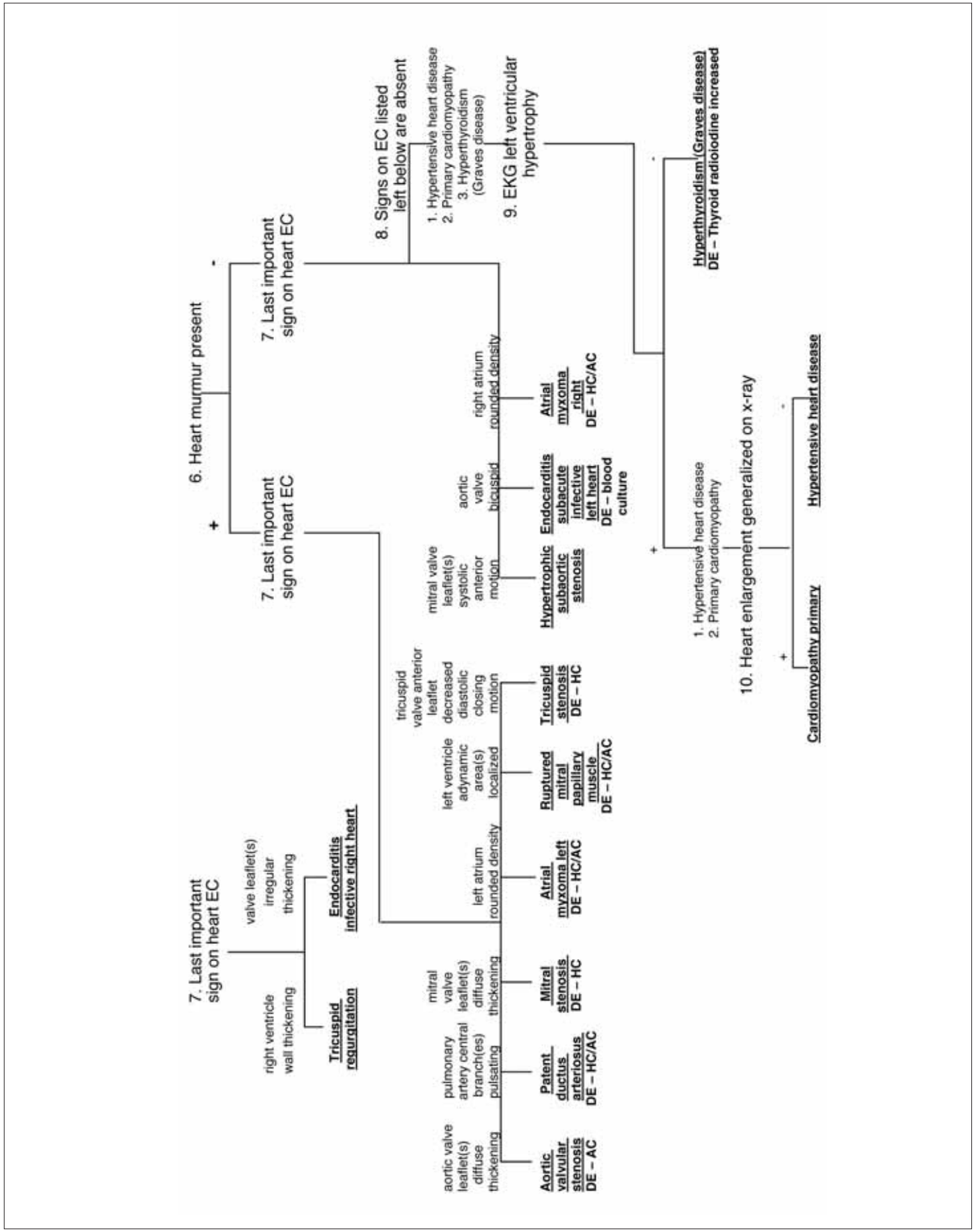
The methods that have written under established diagnoses have the following abbreviations.

DE – Decisive examination;
EC – Echocardiography;
AC – Angiocadiography;
PA – Pulmonary arteriography;
AG - Aortography;
HC - Heart catheterization.


DIFFERENTIAL DIAGNOSTIC ALGORITHM FOR DISEASES, MANIFESTED WITH HEART MURMURS
1. Pericardial friction rub scratching, grating, scarping
+
-
Acute pericarditis
Heart murmurs
2. Heart murmur systolic apical
+
-
11 various heart diseases
24 heart diseases, having non-apical murmurs location
Stage 4.2 under bold line
3. Heart murmur holosystolic apical
+
-
1. Mitral regurgitation rheumatic
2. Rheumatic carditis acute
3. Endocarditis acute infective left heart
4. Cardiomyopathy secondary
5. Mitral regurgitation due to papillary muscle dysfunction
6. Ruptured mitral chordae tendineae
1. Mitral valve prolapse
2. Angina pectoris
3. Angina variant (Prinzmetal's)
4. Crescendo angina
5. Thyrotoxic heart disease
4. Dyspnea exertional
4. Fear of death or impending doom
+
-
+
-
+
-
1. Mitral regurgitation rheumatic
2. Rheumatic carditis acute
1. Endocarditis acute infective left heart
2. Cardiomyopathy secondary
3. Mitral regurgitation due to papillary muscle dysfunction
4. Ruptured mitral chordae tendineae
1. Angina pectoris
2. Angina variant (Prinzmetal's)
3. Crescendo angina
1. Mitral valve prolapse
2. Thyrotoxic heart disease
5. Last important sign
5. Myocardial infarction in history
5. Last important sign
mitral valve leaflet(s) diffuse thickening on heart EC
antibody streptolysin O increased
5. Heart gallop rhythm
+
-
heart sounds midsystolic click augmented by standing
goiter in history
Mitral regurgitation rheumatic
Rheumatic carditis acute
myocardial infarction family in history
heart gallop rhythm
Crescendo angina
Mitral valve prolapse
Thyrotoxic heart disease
DE – AC
Angina pectoris
Angina variant (Prinzmetal's)
Stage 4.1.


4.1. 5. Heart gallop rhythm
+
1. Cardiomyopathy secondary
2. Ruptured mitral chordae tendineae
6. Last important sign
heart enlargement generalized on x-ray
Cardiomyopathy secondary
mitral valve leaflet(s) pansystolic prolapse and separation on heart EC
Ruptured mitral chordae tendineae
-
1. Endocarditis acute infective left heart
2. Mitral regurgitation due to papillary muscle dysfunction
6. Last important sign on heart EC
valve leaflet(s) irregular thickening(s)
Endocarditis acute infective left heart
irregular thickening(s) area(s) localized
Mitral regurgitation due to papillary muscle dysfunction
4.2. 24 heart diseases, having non-apical murmurs location.
3. Heart murmur systolic ejection second left interspace
+
1. Atrial septal defect
2. Patent ductus arteriosus with right to left shunt
3. Pulmonary hypertension secondary
4. Primary pulmonary hypertension
5. Pulmonic valvular stenosis
6. Tetralogy of Fallot
4. Heart murmur diastolic decrescendo second left interspace
+
1. Patent ductus arteriosus with right to left shunt
2. Pulmonary hypertension secondary
3. Primary pulmonary hypertension
5. Dyspnea exertional
Stage 5
-
1. Atrial septal defect
2. Pulmonic valvular stenosis
3. Tetralogy of Fallot
5. Dyspnea relieved by squatting in history
Stage 5
-
1. Aortic valvular diseases
2. Mitral stenosis
3. Tricuspid stenosis
4. Endocarditis
5. Congenital heart disease
6. Hypertensive heart disease
7. Atrial myxoma
(18 diseases)
4. Heart murmur diastolic decrescendo third left interspace
+
1. Aortic regurgitation acute
2. Aortic regurgitation chronic
5. Last important sign on heart echocardiography
Stage 5
-
5. Heart murmur holosystolic fourth interspace left sternal border
Stage 5 under bold line


5. Dyspnea exertional
+
-
Patent ductus arteriosus with right to left shunt
DE - HC
1. Pulmdnary hypertension secondary
2. Pulmonary hypertension primary
6. Right ventricle wall thickening on heart EC
+
-
Pulmonary hypertension secondary
DE – PA
Pulmonary hypertension primary
DE - PA
5. Dyspnea relieved by squatting in history
+
-
Tetralogy of Fallot
DE – EC/AC
1. Atrial septal defect
2. Pulmonic valvular stenosis
6. Last important sign on heart echocardiography
right ventricle end-diastolic internal diameter increased
pulmonic valve posterior leaflet A wave increased
Atrial septal defect
DE – AC/HC
Pulmonic valvular stenosis
DE – AC/HC
5. Last important sign on heart echocardiography
mitral valve leaflet(s) premature closure
left ventricle end-diastolic internal diameter increased
Aortic regurgitation acute
DE - AO
Aortic regurgitation chronic
DE - AO
5. Heart murmur holosystolic fourth interspace left sternal border
+
-
1. Tricuspid regurgitation
2. Ventricular septal defect large
3. Endocarditis infective right heart
4. Ventricular septal defect small
6. Ventricular septal defect on heart echocardiography
+
-
1. Ventricular septal defect large
2. Ventricular septal defect small
DE - AC/HC
7. Last important sign on heart EC
Stage 6
1. Aortic valvular stenosis
2. Patent ductus arteriosus
3. Hypertrophic subaortic stenosis
4. Mitral stenosis
5. Endocarditis subacute infective left heart
6. Hypertensive heart disease
7. Primary cardiomyopathy
8. Hyperthyroidism (Graves disease)
9. Atrial myxoma left
10. Atrial myxoma right
11. Ruptured mitral papillary muscle
12. Tricuspid stenosis
6. Heart murmur present
Stage 6


6. Heart murmur present
+
-
7. Last important sign on heart EC
7. Last important sign on heart EC
8. Signs on EC listed left below are absent
1. Hypertensive heart disease
2. Primary cardiomyopathy
3. Hyperthyroidism (Graves disease)
9. EKG left ventricular hypertrophy
7. Last important sign on heart EC
valve leaflet(s) irregular thickening
right ventricle wall thickening
Tricuspid regurgitation
Endocarditis infective right heart
tricuspid valve anterior leaflet decreased diastolic closing motion
mitral valve leaflet(s) systolic anterior motion
aortic valve bicuspid
right atrium rounded density
Atrial myxoma right DE – HC/AC
Endocarditis subacute infective left heart DE – blood culture
Hypertrophic subaortic stenosis
aortic valve leaflet(s) diffuse thickening
pulmonary artery central branch(es) pulsating
mitral valve leaflet(s) diffuse thickening
left atrium rounded density
left ventricle adynamic area(s) localized
Aortic valvular stenosis DE – AC
Patent ductus arteriosus DE – HC/AC
Mitral stenosis DE – HC
Atrial myxoma left DE – HC/AC
Ruptured mitral papillary muscle DE – HC/AC
Tricuspid stenosis DE – HC
1. Hypertensive heart disease
2. Primary cardiomyopathy
Hyperthyroidism (Graves disease) DE – Thyroid radioiodine increased
10. Heart enlargement generalized on x-ray
Cardiomyopathy primary
Hypertensive heart disease

If a doctor considers, that an algorithmic diagnosis must be the most precise, he can apply last the most reliable, but also the most expensive often invasive examination. If under algorithmical diagnosis such abbreviation is absent, the given last algorithmical diagnosis just is the most reliable.

In the list of these decisive additional examinations the s/s are not specified, because these special procedures have carried out by experts, which own their precision diagnostics in perfection, and will write the final diagnostic conclusion without algorithm.

The symbols + and - in the text of DDA signify the presence or absence of the given sign.

It is necessary to underline especially, that at acquaintance to diagnostic algorithm the reader can feel some psychological discomfort. The text of the algorithm strongly differs from habitual descriptive style of the scientific article. A veritable Differential Diagnostic Algorithm it is very effective working tool for optimization of intellectual diagnostic activity. The algorithm contains only the small list of symptoms/signs, the list of probable illnesses and diagnoses. Except this dry list in the algorithm there are no explanatory phrases. The accurate binding logic of all structure of the algorithm is provided with the connecting brachiates lines and symbols + and - under each s/s. These symbols mean presence or absence of the given signs. The strictest extremely economical logic structure of diagnostic algorithm should not contain any superfluous word.

The definition reminding. Differential Diagnostic Algorithm or diagnostic algorithm is the exact determination about step-by-step of elementary intellectual operations and actions in the certain sequence for establishment of a diagnosis of each of all diseases manifested by the given leading syndrome.

Practical supplements

The author understands that the data submitted in both his articles (2 and this one) are unusual for the majority of teachers, scientists and doctors. Nevertheless, anyone doubting can easily reproduce the similar experiment independently. Write several textual tasks with insertion of s/s heart diseases presented in this DDA, and other typical s/s for these diseases. Then suggest to students and colleagues to write the diagnoses independently with these s/s. Then give to the same people the algorithm cited in this article, and suggest them to write repeatedly diagnoses by the same tasks with the help of algorithm. Then compare results.

You will receive the same or similar results, as presented in L. Naumov's article (2).

General rules of experiment

1) In a brief opening address the experimenter declares to the examinees, that forthcoming experiment has only scientific-methodical sense and is directed for improvement of diagnostics of the diseases, accompanying with a syndrome of murmurs in the field of heart. Confirming the words the experimenter declares, that complete anonymity of all examinees is strictly observed. It liberates examinees, eliminates their suspicion that negative results of the test will used against them.

2) For the best comparison of different results, it is necessary to identify different diagnoses of each experiment tested at different stages. The simplest way is the following. Each examinee chooses any appropriate number by which each participant has designated his diagnoses at both stages of experiment under arrangement among themselves. The experimenter does not know of these numbers, therefore, a full anonymity and safety for examinees have observed. Identical numbers of records on sheets of both stages of experiment will allow comparing distinction of diagnoses at the same examinee at independent diagnostics and with algorithm.

3) The experimenter should have at itself the working version of all tasks for check of diagnoses tested on both stages of experiment quickly. Difference from the operational version of the diagnostic tasks showed by the examinee that in the working version each task comes to the end with the diagnosis established with algorithm. Diagnostic tasks at examinees have only the list of s/s, and the diagnosis they should write themselves.

4) The tasks are expedient for grouping on three degrees of complexity: a) murmurs at often simple heart diseases; b) murmurs at more rare heart diseases; c) murmurs at the illnesses which are not caused by heart diseases.

5) The number of the leaf with printed tasks should suffice for each participant of experiment.

6) At gathering the written down diagnoses after the ending of each stage of experiment to forbid examinees any questions about correct or erroneous diagnoses.

7) In diagnostics of tasks with algorithm, in each task to write down not only the diagnosis, but also numbers s/s of DDA based on which the given diagnosis is established.

8) S/s, diagnoses and a method of diagnostics have acquired by students very quickly with DDA, in most cases within the first demonstration. If with the same examinees to carry out repeated experiment with the same algorithm, then results will be not correct. Independent diagnoses will already use algorithmic signs and method. The difference at both stages and methods of thinking will be small for this reason. Therefore, experiments in comparison to traditional and algorithmic diagnostics should be only single.

9) The number of participants of comparative experiment should increase easily up to many hundreds. For this purpose in the big lecture hall, two big screens beside settle down. For independent diagnostics at the first stage on the first screen conditions of the tasks have projected. When written diagnoses of examinees are collected, on the first screen diagnostic tasks have shown, and on the other screen demonstrate separately each Stage of DDA. Pages of algorithm have delayed on the screen until all participants of experiment have finished the task by means of the given page.

Obligatory conditions of your experiment

1) Participants of experiment - examinees should not be familiar with this article and should not see the Differential Diagnostic Algorithm published here.

2) Print out the DDA from this article. However, do not show it to examinees before to the beginning of the second stage of experiment – diagnostics of the tasks with the DDA.

3) At drawing up of textual diagnostic tasks of heart diseases enter in tasks those s/s, which are used in popular sources, e.g. s/s from student's textbooks of internal illnesses.

4) At drawing up of textual tasks hold the DDA before your eyes. The s/s in every your diagnostic task of heart diseases should be written down in the same formulation as it is submitted in the algorithm. Other s/s, which have been written out from textbooks, can be superfluous and represent an "information noise". However, it is important, that at the decision of the tasks with algorithm the examinee has found in a condition of a task the same s/s, which are available in the DDA.

5) The symbols + and - in the text of DDA signify presence or absence of the given sign. However, in the tasks these symbols should not be, and the list of the s/s available is described by words (see a sample of the task below).

6) For reduction of a time of experiment and repeated recurrence of experiment with other groups, all tasks should be numbered. Examinees write the diagnoses on a common separate sheet. Each diagnosis has the same number, as the task number.

7) At the first stage each examinee inscribes the leaf with diagnoses by the words "independent diagnostics". After the first stage the experimenter has collect of the leafs with the written down independent diagnoses. Any questions of the examinees, any discussion of the written diagnoses have been forbidden.

8) Before the beginning of the second stage of the experiment, each examinee receives a full copy of the algorithm.

9) Together with the algorithm, the experimenter distributes to each examinee 2-3 copies of new demonstrative diagnostic tasks, which did not participate at the first stage of independent diagnostics. Formulations of the decisive s/s in demonstrative tasks and in the DDA should be identical.

10) The experimenter gives to examinees the instruction of work with algorithm (see above).

11) After a confirmation by ALL examinees, that the method of the tasks diagnose with the DDA is understood by each participant, the second stage of experiment begins. Each examinee solves the same tasks that were on the first stage, with the DDA, identifying the number of the diagnosis with the number of the task. On the second stage each examinee inscribes his sheet by words "Diagnostics with algorithm".

12) Upon termination of work, all sheets are selected. Any discussions, any comments under diagnoses it is not suppose. If examinees which find out results of experiment or reliable diagnoses of the tasks, then all subsequent experiments will lose sense, because majority of the following examinees will write correct diagnoses already at independent diagnostics.

The repeated decision of the diagnostic task by means of the DDA

To not come back to the beginning of the article, for comparing conditions of the task with algorithm on different pages, the same diagnostic task, which is more convenient for solving already after familiarization with the algorithm, has written repeatedly below.

Diagnostic task

The 23-year-old woman, with complaints for dyspnea exertional. At heart auscultation, the murmurs continuous are present in the pulmonic area with no interruption between the systolic and diastolic components. The detail characteristic of the murmurs is the following. The heart murmur systolic ejection second left interspace and heart murmur diastolic decrescendo second left interspace.

Now we shall start the method of differential diagnostics by means of the algorithm. On the same tasks, as for the first time, you will establish diagnoses by means of this algorithm now. To familiarize with the methodology of diagnostics by means of algorithm, please, return to the task. We together shall diagnose of this task with algorithm. Read this task again, and write down the own diagnosis for itself

Remark: For exercise in algorithmic diagnostics of diagnostic tasks, it is quite enough to write down only the basic diagnosis printed by the bold font and underlined.

Now we shall establish the diagnosis of the same task by means of the algorithm together.

Put your finger on the first sign of the algorithm.

1. Pericardial friction rub scratching, grating, scarping, and closely examine the signs listed in this task. If this sign in a task is present, that have been designated by plus, then the correct diagnosis is Acute pericarditis. If such sign in the task is absent (the minus), it means, that it is murmurs of heart.

The following sign is 2. Heart murmur systolic apical. In our task such sign is absent, therefore, we go on the right branch of the algorithm. Here we see the intermediate conclusion 24 heart diseases, having non-apical murmurs location. Continuation is on Stage 4.2. under bold line.

We pass to the specified page, and under of the bold horizontal line we see the continuation of this branch of algorithm 3. Heart murmur systolic ejection second left interspace. This sign is presents in our task. However, it meets at six diseases. For the further differentiation, we pass to the following sign in this branch 4. Heart murmur diastolic decrescendo second left interspace. This sign presents in our task. It is necessary to divide of three probable diagnoses.

The following dividing sign 5. Dyspnea exertional presents in our task too. Below we read the final diagnosis Patent ductus arteriosus with right to left shunt.

So, on this algorithm based on the two first negative signs 12 illnesses have excluded, the third positive sign has excluded still 7 diseases. The fourth positive sign has excluded from 6 residuary

illnesses else 3 ones. Finally, fifth last sign from 3 probable illnesses has excluded 2, and has allowed establishing the final diagnosis based only on auscultative data. Thus, based on 5 popular signs 27 diseases are excluded and the reliable diagnosis is established with the algorithm.

On such method the differential diagnostics is carried out, and the final diagnoses of all of 35 illnesses with heart murmurs have established.

Compare your independent diagnosis on this task to the diagnosis by the algorithm. Hardly at all students these diagnoses are coincide. It is rather probable, that the independent diagnosis is erroneous. This is a certificate of advantage of syndromic algorithmic thinking before usual nosological process of thinking.

Conclusion

The Differential diagnostic algorithms developed by the author completely coincides with practical purposes of auscultative diagnostics.

The algorithm has based on a syndromic principle of thinking. The DDA for diseases manifested by heart murmurs syndrome has designed for the large syndrome, and provides diagnostics of all or majority illnesses manifested by given syndrome.

Differential diagnostics of illnesses inside of each syndrome provides by a minimum of the most informative decisive s/s.

The algorithm does not contain anything superfluous, but only the most necessary for fast effective differential diagnostics and defines of reliable diagnosis by the most convincing s/s.

It is expedient to scan from the article the algorithm and the technique of work with it. These scanned pages should be on a desktop and in a PC at each practitioner and at each medical student.

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