

Additional file 4. Two-step expert evaluation: Design and results

➤ Eleven primary care clinicians from Chinese People's Liberation Army

General Hospital participated in expert evaluation and have worked in the health examination department to formulate health examination items.

Primary care clinician type	Major	Professional title	Working years	Number of primary care clinicians
General	General	Senior	over 20	1
General	General	Intermediate	over 20	2
General	Cardiology	Senior	over 20	1
General	Cardiology	Intermediate	over 20	3
General	Endocrinology	Intermediate	over 20	1
General	Neurology	Senior	over 20	1
General	Gastroenterology	Senior	over 20	1
General	Respiratory	Intermediate	over 20	1

➤ The evaluation form in expert evaluation.

Identification number	Gender	Age	
122371	Female	33	
Health History			
1. High blood pressure 2. Overweight, abdominal obesity 3. Fatty liver (mild) 4. Anemia 5. Binocular myopia 6. Tooth decay 7. Tooth residual crown 8. Cervicitis			
System-recommended health examination items (Appendix: All health examination items)			
Number	Health examination item	Decision	Reason
1	General item (Blood pressure, pulse, waist circumference, hip circumference, height, weight)		

2	Internal medicine (Auscultation of heart and lungs, palpation of liver, percussion of kidney area, palpation of dorsal foot artery)		
3	Surgery (Thyroid, superficial lymph node palpation, spine, limb joints, digital anus, breast palpation)		
4	Ophthalmology (Vision)		
5	Otorhinolaryngology (External ear, nasal cavity, oropharynx)		
6	Stomatology (Dental, periodontal, oral mucosa, tongue, temporomandibular joint, oral and maxillofacial, submandibular)		
7	Gynecology (Pap smear, vulva, vaginal examination, cervix, uterus, appendages, pelvic cavity, anus and abdominal examination)		
8	Blood routine		
9	Urine routine		
10	Bowel routine		
11	Blood chemistry (With blood sugar (fasting))		
12	Blood tumor marker screening (women) (Carcinoembryonic antigen CEA, alpha-fetoprotein AFP, carbohydrate antigens CA9-9, CA72-4; cytokeratin 19, neuron-specific enolase NSE, squamous cell carcinoma-associated antigen SCC; cancer antigens CA15-3, CA12-5)		
13	Thyroid function		
14	Electrocardiogram ECG (12 leads)		
15	Ordinary chest (lung) CT		
16	Abdominal ultrasound		
17	Abdominal gynecological ultrasound		
18	Ultrasound of bilateral breast and accessory breast		
19	Body composition analysis (Weight, body fat mass, muscle mass, body water content, obesity judgment, body balance)		

	analysis, body composition analysis, nutritional composition analysis)		
20	Sleep breathing monitoring		
21	Pulmonary function test (Conventional lung volume SVC, flow volume loop FVC, minute ventilation MVV)		
Supplementary items			
Number	Health examination item	Reason	
1			
2			
3			
4			
5			

➤ **Statement of advice for expert document design in pre-evaluation.**

Evaluation form content
1. Add date of diagnosis and positive findings.
Evaluation criteria
1. The genders of the participants should be divided equally.
2. Emphasize that in the “decision” column, it must be filled in, and the neutral one must also be filled in.
Result processing
1. The supplementary items need to be proofread with the complete set of health examination items to determine whether they are the same items or items covered by the health examination.
2. The results of round one of expert evaluation will be calculated by a majority vote, and uncertain items will be discussed in the round two.

➤ **Statement of advice for the health examination item recommendation in formal evaluation.**

Decision-making method
1. First, the health examination items recommended for common diseases are listed, then the health examination items that need to be focused on at different ages are listed, and finally they are combined with the routine health examination items.
2. The basic package is combined with recommended items based on age, gender, underlying diseases, personal requirements, etc.
3. On the basis of the regular package, list the health examination items recommended according to the disease, remove duplicate items, add

personalized items or formulate health examination items for the second echelon.
Health feature
1. Participants have multiple health history features, some of which can be distinguished from primary and secondary, and some cannot be distinguished from primary and secondary. The computer should give weights to each feature to select health examination items.
Specific health examination item
1. In the health examination of young people, the analysis of body composition is more important, which is convenient for guiding young people to exercise and live; the incidence of thyroid diseases is relatively young, and thyroid ultrasound needs to be listed as a routine health examination; if fatty liver is suspected, abdominal MRI can be considered. 2. Thyroid ultrasonography is a mandatory health examination item; mammography is replaced with breast MRI; women who are married or sexually active should have transvaginal ultrasonography; coronary CTA is not a health examination item, which has invasive risks and requires specialist evaluation. 3. Add hepatitis B virus examination as a routine health examination item; the recommended conditions for coronary CTA need to be stricter.

- **Primary care clinicians' attitude towards personalized health examination and decision support system. The target group such as sunset red package, smoker package. The disease screening such as cardiovascular and cerebrovascular packages, diabetes packages. The evaluation recommendation such as the proposed system strategy.**

