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Testing a computer based virtual patient tool to help doctors find a rare head and neck cancer earlier

Submission date
13/04/2026

Recruitment status
Recruiting

Registration date
15/04/2026

Overall study status
Ongoing

Last Edited
14/04/2026

Condition category
Cancer

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Nasopharyngeal carcinoma is a rare type of cancer that starts in the nasopharynx, which is the upper part of the throat behind the nose. It is more common in some parts of southern China than in Europe. Early stages often cause few or no clear symptoms, which means the cancer is sometimes found late. This study aims to find out whether a new computer based tool, called a digital twin system, can improve existing screening tests so that this cancer can be found earlier and more accurately. The digital twin uses health data to create a virtual model of a person to help estimate their risk of disease.

Who can participate?
Adults aged 30 years to 69 years who live in Zhongshan City in Guangdong Province, China may be able to take part. Participants must already be involved in the local screening programme for nasopharyngeal carcinoma and must not have had this cancer before. People with serious ongoing illnesses or conditions that affect their immune system cannot take part.

What does the study involve?
Participants will take part in routine blood tests that are already used in screening programmes. These tests look for antibodies linked to Epstein-Barr virus, which is known to increase the risk of nasopharyngeal carcinoma. Information such as age, sex, and family history of this cancer will also be collected. For some participants, this information will then be analysed using the digital twin system to estimate cancer risk. Depending on the risk level, some people may be asked to attend follow-up tests such as a throat examination. No experimental treatments are given.

What are the possible benefits and risks of participating?
Participants may benefit from having their risk of cancer assessed more accurately, which could help find the disease earlier if it is present. Early detection usually gives a better chance of successful treatment. There are no extra medical risks beyond standard screening tests, as the study does not add new procedures or treatments. Blood tests and examinations are part of routine care.

Where is the study run from?
The study is run from The First Affiliated Hospital of Jinan University and the Cancer Research Institute of Zhongshan City People's Hospital, both based in China.

When is the study starting and how long is it expected to run for?
The study is planned to start in April 2026. It is expected to run until December 2028.

Who is funding the study?
The study is funded by the National Key Research and Development Program of China.

Who is the main contact?
Professor Shuixing Zhang, shui7515@126.com

Contact information

Type(s)
Principal investigator, Public, Scientific

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Study information

Scientific Title
Diagnostic efficacy of a digital twin system for early screening of nasopharyngeal carcinoma

Study objectives
To prospectively validate the performance of the Digital Twin System combined with traditional Epstein-Barr virus (EBV) serological screening in improving the positive predictive value for nasopharyngeal carcinoma (NPC) screening in the high-incidence area of Zhongshan, Guangdong.

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 01/04/2026, Medical Ethics Committee of Jinan University (Jinan University, Guangzhou, 510620, China; +86 020-85220250; oykyc@jnu.edu.can), ref: JNUECKY-20260325-007

Primary study design
Observational

Secondary study design
Cohort study

Study type(s)

Health condition(s) or problem(s) studied
Nasopharyngeal carcinoma screening

Interventions
Study design: Prospective cohort study.
Study population: Local residents aged 30–69 years in Zhongshan, Guangdong, who participated in NPC screening from January 1 to December 31, 2026; inclusion requires no history of NPC and signed informed consent.
process:
Collect serological and epidemiological data (gender, age, family history) of medium- and high-risk populations;
Further stratify risk via the HD model to determine follow-up measures (nasopharyngoscopy or serological follow-up).
Outcome analysis: Calculate core diagnostic indicators; compare efficacy with serological screening alone; conduct cost-effectiveness analysis (cost-effectiveness ratio [CER], incremental cost-effectiveness ratio [ICER]).

Intervention Type
Not Specified

Primary outcome(s)
1. Sensitivity measured using Calculation of sensitivity using standard diagnostic test statistics based on combined screening results compared with reference diagnosis from clinical assessment and follow-up data at At completion of screening and follow-up of the 2026 study cohort

2. Specificity measured using Calculation of specificity using standard diagnostic test statistics based on combined screening results compared with reference diagnosis from clinical assessment and follow-up data at At completion of screening and follow-up of the 2026 study cohort

3. Positive predictive value measured using Calculation of positive predictive value using standard diagnostic test statistics based on combined screening results compared with reference diagnosis from clinical assessment and follow-up data at At completion of screening and follow-up of the 2026 study cohort

4. Negative predictive value measured using Calculation of negative predictive value using standard diagnostic test statistics based on combined screening results compared with reference diagnosis from clinical assessment and follow-up data at At completion of screening and follow-up of the 2026 study cohort

Key secondary outcome(s))

Completion date
01/12/2028

Eligibility

Key inclusion criteria
1. Registered population aged 30–69 years in the screening area (Zhongshan City)
2. No previous history of nasopharyngeal carcinoma
3. Participants who agreed to sign the informed consent form

Healthy volunteers allowed
Yes

Age group
Mixed

Lower age limit
30 years

Upper age limit
69 years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Patients with severe cardiac, cerebral, hepatic, pulmonary or renal diseases
2. Patients with severe immune system diseases
3. Patients currently receiving glucocorticoid or immunosuppressive therapy
4. Individuals with poor mental status and impaired consciousness

Date of first enrolment
15/04/2026

Date of final enrolment
01/12/2028

Locations

Countries of recruitment
China

Study participating centre
The First Affiliated Hospital of Jinan University
China

Study participating centre
Cancer Research Institute of Zhongshan City, Zhongshan City People's Hospital
China

Sponsor information

Organisation
Jinan University

ROR
https://ror.org/02xe5ns62

Funder(s)

Funder type

Funder Name
National Key Research and Development Program of China

Alternative Name(s)
, National Basic Research Program of China (973 Program), Special Fund for the National Key Research and Development Plan, China National Key Research and Development Plan Project, National Key Research and Development of China, National Key Research and Development Program, National Key R&D Program of China, National Key R&D Programmes of China, China's National Key R&D Programmes, National Basic Research Program of China, 973 Program, National Program on Key Basic Research Project (973 Program), National Plan on Key Basic Research and Development, National Basic Research Program, NKRDPC, NKPs

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
China

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available