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Personalized prostate cancer prevention and management

Submission date
02/10/2025

Recruitment status
Recruiting

Registration date
03/10/2025

Overall study status
Ongoing

Last Edited
03/10/2025

Condition category
Cancer

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

Plain English summary of protocol
Background and study aims
The DP3 study is investigating how lifestyle, health history, and new blood biomarkers (particularly lipids and proteins) can improve prostate cancer (PCa) screening. Current PSA testing often leads to unnecessary invasive procedures, such as biopsies. By combining PSA with lifestyle and molecular data, we aim to better identify men who are at higher or lower risk.
As part of DP3, we also launched a Nordic Walking (NW) ancillary study to test whether regular supervised exercise can improve fitness, body composition, cardiometabolic health, PSA levels, and blood biomarkers in sedentary men.

Who can participate?
Men aged 50 years or older who are undergoing PSA testing as part of routine health care or prostate cancer screening in participating centers in the Piedmont region of Italy.

What does the study involve?
Participants provide detailed information on lifestyle, family and medical history, and undergo physical fitness assessments, anthropometric measures, and questionnaires on well-being. Blood samples are collected for PSA and biomarker testing.
In the NW substudy, men are invited to join a supervised Nordic Walking program (twice per week, up to 12 months). A comparison group continues with usual lifestyle.

What are the possible benefits and risks of participating?
Benefits may include improved physical fitness, weight control, blood pressure regulation, and overall well-being. Blood and molecular testing may provide useful information for future prevention strategies. Risks are minimal, limited to possible mild discomfort from blood draws and physical activity (e.g. muscle soreness).

Where is the study run from?
The study is coordinated at the Fondazione Edo ed Elvo Tempia in Biella (Italy) and involves collaborating hospitals in Piedmont.

When is the study starting and how long is it expected to run for?
Recruitment began in 2021. Participants are followed for at least 18 months, with ongoing long-term follow-up planned. The NW study started in 2023 and ended in 2025.

Who is funding the study?
The study is investigator-initiated and supported by institutional and regional resources, with no commercial sponsorship. The DP3 study is funded by Compagnia di San Paolo, Fondazione CRT, Rete Oncologica del Piemonte e della Valle d'Aosta, Banca d'Italia. The NW study is funded by Reale Foundation.

Who is the main contact?
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Additional identifiers

Protocol serial number
DPPP12345

Study information

Scientific Title
Diagnosis and prognosis prediction of prostate cancer: an integrated model between biology and technology

Acronym
DP3

Study objectives
The objectives of the main study DP3 are to evaluate molecular biomarkers in combination with clinical, lifestyle, and anamnestic data to personalize prostate cancer (PCa) screening strategies in men aged >50 years old men and to predict prostate cancer aggressiveness, especially for intermediate risk tumors.

Given the significant association between physical activity and recall rate reduction and the paucity of data on adherence-dependent effects of structured exercise in PCa screening populations, we designed an ancillary study of DP3. This is a real-world prospective study to assess whether different degrees of participation in a supervised NW program could translate into measurable improvements in fitness, cardiometabolic health, and prostate-related outcomes.

The primary objective of the ancillary study is to determine whether regular participation of sedentary men over 50 in supervised NW leads to improvements in physical fitness, anthropometric measures, cardiometabolic risk factors, mental well-being, and PSA levels over 6-12 months. We hypothesize that greater adherence to NW sessions is associated with larger health benefits. Therefore, the study is not a randomized intervention study with a strict protocol but a real-world study where participants are free to adhere to the NW sessions according to their possibilities. Controls are randomly chosen men recruited for the DP3 study who agree to participate in the ancillary study and whose characteristics are comparable with those of the NW group in terms of age, PSA, family history of cancer, and physical activity.

A secondary, exploratory objective is to evaluate whether NW induces detectable systemic changes in circulating protein profiles.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 07/09/2020, Comitato Etico Territoriale Interaziendale AOU Maggiore della Carità (Corso Mazzini 18, Novara, 28100, Italy; +39 (0)3213733081; comitatoetico@maggioreosp.novara.it), ref: Prot. N°968/CE 07/09/2020, integrations Prot. N°263/CE, 10/03/2021 and Prot. N° 250/CE, 21/03/2023 specific for the NW ancillary study

Primary study design
Observational

Study design
Prospective observational trial with ancillary real-world longitudinal study

Study type(s)
Prevention

Health condition(s) or problem(s) studied
Prostate cancer

Interventions
Longitudinal blood sampling is carried out with isolation and storage of plasma, serum and PBMCs; PSA dosage is performed from serum; analysis of circulating microRNAs, sphingolipids and proteins is carried out from plasma; totRNA-sequencing is done starting from fixed tissue; image analysis is performed on digital pathology records; urine samples and questionnaire records on recent clinical history, family history of (prostate) cancer and lifestyle are collected at baseline.

For the ancillary study: PSA levels, functional tests, anthropometric measures, and questionnaires on lifestyle, well-being, and disease risk factors are collected at baseline, 6, and 12 months.

Intervention Type
Behavioural

Primary outcome(s)
Blood sampling is performed at baseline and: every 6 months, for at least three times, in men without any prostate cancer suspicion; at each recall in men with prostate cancer suspicion; before prostatectomy and at each follow-up up to three years after radical prostatectomy in men who undergo surgery. Plasma only is isolated at every time point after baseline.
1. Serum, plasma and PBMCs are isolated within 1 hour after blood sampling at baseline using centrifugation and Ficoll gradient separation
2. Plasma is isolated at every time point after baseline using centrifugation of EDTA K2 tubes at 2500 rpm for 10 min at 4°C, repeated twice
3. Serum is isolated at baseline using centrifugation of serum-specific tubes at 2500 rpm for 10 min at 4°C
4. PBMCs are isolated at baseline using Ficoll gradient separation

5. Urine supernatant and pellet are isolated at baseline or before fusion biopsy using centrifugation at 15000 rpm for 30 min at 4°C
6. PSA concentration is measured using Elecsys total PSA kit IVD at baseline and at each follow-up time point
7. Plasma circulating levels of miR-103a-3p, miR-5100, and let-7a-5p are measured using RT-qPCR and Taqman assays at baseline and after prostatectomy in men diagnosed with prostate cancer and treated surgically
8. Plasma circulating sphingolipids are measured using targeted lipidomics via mass spectrometry at baseline and after prostatectomy in men diagnosed with prostate cancer and treated surgically
9. Plasma circulating proteome is measured using the Olink Explore HT platform at baseline, after prostatectomy in men diagnosed with prostate cancer and treated surgically, and after 6 months in men enrolled in the NW ancillary study
10. Transcriptomic profile of PBMCs is measured using total RNA sequencing at baseline
11. Transcriptomic profile of fixed prostate tissue is measured using total RNA sequencing in men with intermediate-risk prostate tumors (ISUP grade 2–3)
12. Urinary microbiota is measured using Pathochip arrays (Agilent) starting from DNA and RNA isolated from urine sediments at baseline or before fusion biopsy
13. Lifestyle factors including physical activity, BMI, diet, smoking and alcohol consumption are measured using self-reported questionnaires at baseline
14. Familial history, past prostate biopsies and concurrent pathologies are measured using self-reported questionnaires at baseline
15. PSA levels and digital rectal examination outcomes are measured using clinical records and urological visit reports at baseline and at each follow-up time point
16. Histological and clinical information for prostate tumors is recorded using pathology reports and clinical records at each follow-up time point
17. Electronic Case Report Forms (eCRF) including questionnaires, urological visit reports, PSA dosage and lab analyses are uploaded to a password-protected online database (https://www.keyform.eu) at each follow-up time point

Key secondary outcome(s)

These measures are carried out in the ancillary study only:
1. Sedentary behavior is measured using the Global Physical Activity Questionnaire (GPAQ) at baseline, 6 months, and 1 year (for NW group only)
2. Physical activity in occupational, transport-related, and leisure-time contexts is measured using the Global Physical Activity Questionnaire (GPAQ) at baseline, 6 months, and 1 year (for NW group only)
3. Weekly level of moderate to vigorous physical activity (MVPA) is measured using metabolic equivalents (METs) derived from GPAQ data at baseline, 6 months, and 1 year (for NW group only)
4. Psycho-physical health and quality of life are measured using the SF-12 questionnaire at baseline, 6 months, and 1 year (for NW group only)
5. Height, weight, and hip and waist circumferences are measured using anthropometric assessment at baseline, 6 months, and 1 year (for NW group only)
6. Body mass index (BMI) is calculated from height and weight measurements at baseline, 6 months, and 1 year (for NW group only)
7. Blood pressure, O2 saturation level, and resting heart rate are measured using clinical assessment at baseline, 6 months, and 1 year (for NW group only)
8. Upper limb strength is measured using the Handgrip Test at baseline, 6 months, and 1 year (for NW group only)
9. Dynamic balance, mobility, and fall risk are measured using the Timed-Up-and-Go Test at

baseline, 6 months, and 1 year (for NW group only)
10. Lower limb strength and endurance are measured using the 30'' Sit-to-Stand Test at baseline, 6 months, and 1 year (for NW group only)
11. Aerobic capacity and endurance are measured using the 6 Minute Walking Test (6WT) at baseline, 6 months, and 1 year (for NW group only)
12. Rating of perceived exertion (RPE) is measured using subjective self-assessment during the 6 Minute Walking Test at baseline, 6 months, and 1 year (for NW group only)
13. Body roundness index (BRI) is calculated using waist circumference and height measurements at baseline, 6 months, and 1 year (for NW group only)
14. A Body Shape Index (ABSI) is calculated using waist circumference, BMI, and height measurements at baseline, 6 months, and 1 year (for NW group only)
15. Conicity index is calculated using waist circumference, weight, and height measurements at baseline, 6 months, and 1 year (for NW group only)
16. Plasma circulating proteome is measured using the Olink Explore HT platform at baseline and after 6 months (for NW group only)

Completion date
30/06/2028

Eligibility

Key inclusion criteria
1. Informed consent signed
2. Males, caucasian
3. 50-79 years
4. Availability of clinical records

Only for the ancillary NW study:
5. Willing to enroll or already enrolled in the DP3 main study
6. Informed consent signed
7. Not used to regular physical activity
8. Non-competitive medical certificate signed before starting the NW program

Participant type(s)
Other

Healthy volunteers allowed
No

Age group
Senior

Lower age limit
50 Years

Upper age limit
79 Years

Sex
Male

Key exclusion criteria
1. Previous diagnosis of prostate cancer
2. Previous (in the last 5 years) or current diagnosis of malignant cancer
3. Immunosuppressive therapy for transplant

Only for the NW ancillary study:
4. Impossibility of carrying out physical activity

Date of first enrolment
22/02/2021

Date of final enrolment
31/12/2026

Locations

Countries of recruitment
Italy

Study participating centre
Fondazione Edo ed Elvo Tempia
via Malta 3
Biella
Italy
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Study participating centre
Nuovo Ospedale degli Infermi
via dei Ponderanesi 2
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Study participating centre
Città della Salute e della Scienza
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Sponsor information

Organisation
Fondazione Edo ed Elvo Tempia

ROR
https://ror.org/01x5t2m44

Funder(s)

Funder type
Charity

Funder Name
Compagnia di San Paolo

Alternative Name(s)
San Paolo Company, San Paolo Company Foundation, Compagnia San Paolo, Fondazione Compagnia di San Paolo, CSP, FCSP

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
Italy

Funder Name
Fondazione CRT

Alternative Name(s)
CRT Foundation

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
Italy

Funder Name

Rete Oncologica del Piemonte e della Valle d'Aosta

Alternative Name(s)
Oncology Network of Piedmont and Valle d'Aosta

Funding Body Type
Government organisation

Funding Body Subtype
Other non-profit organizations

Location
Italy

Funder Name
Banca d'Italia

Alternative Name(s)
Bank of Italy

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
Italy

Funder Name
Reale Foundation

Results and Publications

Individual participant data (IPD) sharing plan
The data published in Journal of Translational Medicine are available from the corresponding author upon request; the data of the NW ancillary study are deposited at the following link: https://doi.org/10.5281/zenodo.16100008. The studies did not include the use of custom codes. The future data obtained from proteomics analyses will be stored in a publicly available repository (Zenodo).

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Dataset		26/07/2025	02/10/2025	No	No
Interim results article		14/07/2025	02/10/2025	Yes	No
Statistical Analysis Plan			03/10/2025	No	No