

# Artificial Intelligence in Prostate Cancer: Predicting Who ADT Can Help

## Plain Language Summary

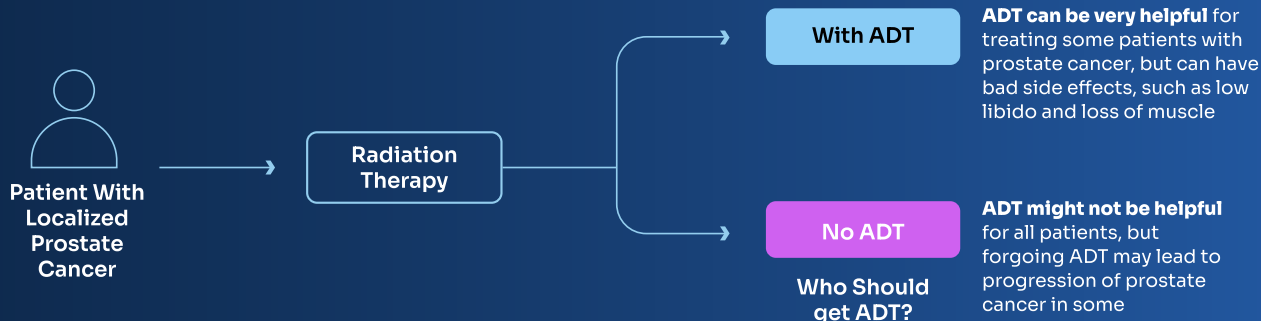
This is a summary of the results from a published scientific article. You can read the original article published in *NEJM Evidence*, called “Artificial Intelligence Predictive Model for Hormone Therapy Use in Prostate Cancer” at: <https://doi.org/10.1056/EVIDoa2300023>

### Who should read this summary?

This summary is for anyone who wants to learn more about tools that help determine treatment in men with prostate cancer. It may be useful for patients, their families, and healthcare professionals.

### Why was this research needed?

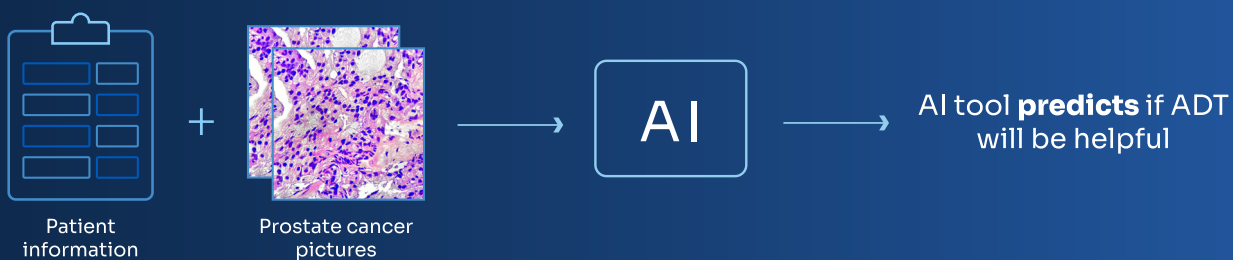
Prostate cancer that is only in the prostate gland is called “localized prostate cancer”. However, the cancer can spread to other parts of the body through a process called “metastasis”. Radiation therapy is when high energy radiation is used to kill cancer cells and is often used to eliminate localized prostate cancer.



Androgen-deprivation therapy (ADT) reduces the amount of male hormones, such as testosterone, in the body. This can be very helpful for treating localized prostate cancer when used with radiation therapy. However, ADT might not be helpful for everyone and can have side effects, such as low libido, erectile dysfunction, loss of muscle, and increase in body fat. Prior to this research, it was challenging to decide which patients would benefit from ADT the most.

### How did this research use AI?

This research investigates if an artificial intelligence (AI) tool can tell whom ADT will help. This AI tool uses microscopic pictures of prostate cancer and some basic information about the patient (age, enzyme levels, and tumor size) to predict if ADT will be helpful in treating the prostate cancer. The information that was used was all taken from when the cancer was diagnosed. Thus, no additional procedures were needed.



## How was this AI tool made?

The AI tool was built using data from four large previously conducted clinical trials that looked at whether ADT was helpful in patients with localized prostate cancer who were given radiation therapy.

- Data from a total of 2024 patients with localized prostate cancer were used
- All these patients were given radiation therapy, and about half were also given ADT
- These clinical trials were conducted between 1992 and 2008 in the United States and Canada
- On average, these patients were followed for 11 years to see if the prostate cancer spread to other parts of the body

The AI tool was given biopsy images of the prostate cancer from when the patient was diagnosed and some basic information about them. The AI tool was also told if the patient was given ADT or not and if they had metastasis. The AI tool learned from all this information to develop a way to tell if someone would be more likely to have better outcomes if they were given ADT.

## What was done to see if the AI tool worked?

Data from another large clinical trial were used to see if the AI tool worked. Here, we refer to this as the “test group.”

- Data from a total of 1594 patients with localized prostate cancer were used
- All these patients were given radiation, and about half were also randomly selected to be given ADT for 4 months
- This clinical trial was conducted between 1994 and 2001 in the United States and Canada
- On average, these patients were followed for 15 years to see if the prostate cancer spread to other parts of the body

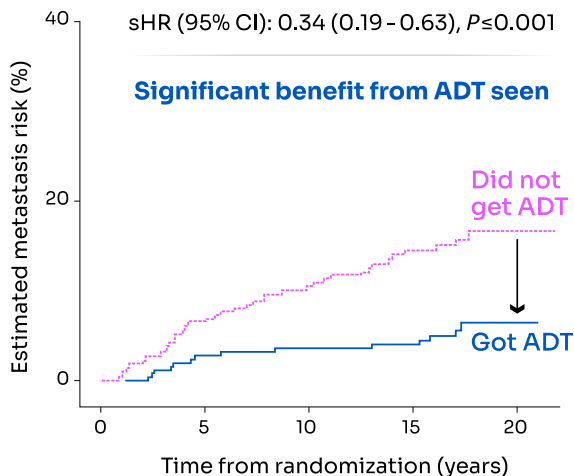
The AI tool was given the cancer images and patient information and asked to predict whether ADT would be helpful. The AI tool was not told if the patient ended up with metastasis or if they were given ADT. The results from the AI tool were compared to what actually happened to see if ADT helped stop metastasis in those it was predicted to help.

### What did this research show?

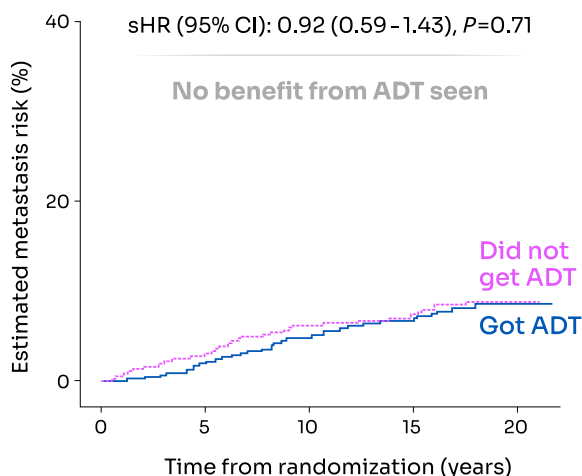
In the test group, the AI tool predicted that in patients who got radiation therapy, that ADT:

- **Was helpful** at preventing metastasis in **34%** of the patients
- **Was not helpful** at preventing metastasis in 66% of the patients. These patients could have avoided the side effects of ADT

#### AI predicted that ADT will be helpful



#### AI predicted that ADT will not be helpful



#### When the AI predicted that ADT would be helpful:

- ADT actually lowered the chances of metastasis within 15 years by 66%
- ADT actually lowered the chances of dying from prostate cancer within 15 years by 72%

#### When the AI predicted that ADT would not helpful:

- ADT did not lower the chances of metastasis within 15 years
- ADT did not lower the chances of dying from prostate cancer within 15 years

There were no major differences in patient characteristics (eg, average age, race) between those that ADT was predicted to help and those that ADT was not predicted to help.

## Why is this research important?

This AI tool was able to tell which patients with localized prostate cancer would benefit from ADT, when added to radiation therapy. Because ADT will not be helpful for everyone, some patients could avoid the side effects caused by ADT.

This summary reports the results of a single study. Patients should discuss options with a healthcare professional, who will help make treatment decisions based on all available evidence.

## Is this AI tool available?

Yes. An updated version of the AI tool that predicts if ADT will be helpful is available as part of the ArteraAI Prostate Test. More information about the ArteraAI Prostate Test can be found at [artera.ai](https://artera.ai). Consult with your physician to determine if the ArteraAI Prostate Test may be appropriate for you.

## Where can I find more information?

The original article described in this summary was published in *NEJM Evidence* and can be found at: <https://doi.org/10.1056/EVIDoa2300023>

Another article describing an AI model that can tell how aggressive a prostate cancer is by estimating the chances of metastasis or death due to prostate cancer was published in *NPJ Digital Medicine* and can be found at: <https://doi.org/10.1038/s41746-022-00613-w>

## Glossary of terms

**Artificial Intelligence (AI):** The ability of a computer program to learn and provide helpful information.

**Androgen-deprivation therapy (ADT):** Drugs that lower male hormones like testosterone in the body.

**Clinical trial:** A research study where treatments are tested on people

**Localized prostate cancer:** Prostate cancer that is only in the prostate and has not spread to other parts of the body.

**Metastasis:** Cancer that has spread to other parts of the body.

**Radiation therapy:** Treatment using high-energy radiation to target and destroy cancer cells.

*The ArteraAI Prostate Test is available as part of Artera's CLIA-validated laboratory-developed test (LDT) service. These tests have not been cleared nor approved by the FDA.*