

Results of the TIME study

Lay Summary

Official study name

Treatment in Morning versus Evening (TIME) study.

Trial Registration

<https://www.isrctn.com/ISRCTN18157641> (registered 20th October 2014)

Summary of Results

The TIME study compared morning dosing of blood pressure lowering medication with evening dosing of the same medication for people with high blood pressure.

- **The TIME study found no difference between morning and evening dosing times in terms of heart attacks, strokes, and cardiovascular death.**
- There was also no difference in hospital admissions for heart failure or eye glaucoma and no difference in falls or broken bones.
- There were some small differences in possible side effects reported by participants.
 - People taking their medications in the morning were more likely to tell us they had dizziness or light-headedness, upset stomach or indigestion, diarrhoea, or muscle aches.
 - People taking their medications in the evening were more likely to tell us they had noticed excessive visits to the toilet.

What do the TIME study results mean?

The TIME study results will help patients and doctors choose how best to take blood pressure medications.

People currently taking blood pressure medications need not change the time at which they take them. However, some people may prefer to take their blood pressure medications at a different time to reduce the chance of forgetting to take them or to minimise side effects. The TIME study results mean people can choose the time of day that suits them best.

Why was this study done?

High blood pressure is a significant cause of heart attacks, strokes and deaths worldwide. Blood pressure-lowering medications have been proven to reduce the risk of suffering a heart attack, a stroke, or dying from disease of the heart or blood vessels (cardiovascular death).

Previous research suggested that taking medications for blood pressure at night might be better than taking them in the morning to prevent heart attacks, strokes, and cardiovascular deaths. If this were true, it would be a simple and effective way to improve the management of high blood pressure.

The TIME study aimed to determine if people taking their blood pressure medicines at night would have fewer heart attacks and strokes and would be less likely to die from cardiovascular disease.

Study Information

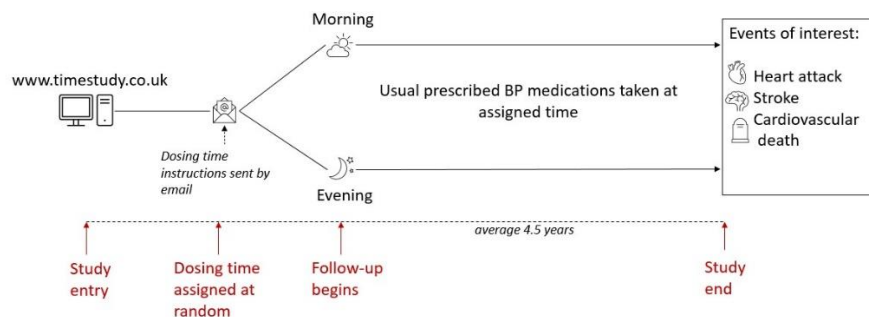
- A pilot study began in 2011, and the main study recruitment started in December 2014. Active study follow-up finished on 31st March 2021, and the study ended on 27th July 2022.
- The study included 21,104 participants from across the UK (England, Wales, Scotland, and Northern Ireland).
- All participants were adults aged 18 years or over with high blood pressure (hypertension) treated with once-daily medication.
- Participants ranged in age from 19 to 95 years (average age 65), and just over half were male. 13% of participants had previous cardiovascular disease (heart attack, angina, stroke, or peripheral vascular disease), and a similar proportion had a diagnosis of diabetes. Before joining the study, most participants (17 out of 20) took their blood pressure medications in the morning. The average number of blood pressure medications they took at study entry was between 1 and 2.

How the study worked

- After consenting to participate in the study, all participants provided information about their previous and current health and medications.
- Then, they were sent an email instructing them on what time to take their usual blood pressure medications. This dosing time was determined by chance (randomised).
- Participants were asked to complete an online follow-up questionnaire at regular intervals during the study. The questionnaire asked about dosing time, side effects, and whether they had a heart attack or stroke. Participants were also asked to record any changes to their regular medications.

- At the same time, the study team accessed centrally-held NHS records to identify if any participants had been admitted to hospital or had died. The study team also contacted GPs, hospitals, and local Registrars to learn more about these events.
- Information about possible heart attacks, strokes, or cardiovascular deaths was used to determine whether the people taking their medication in the evening had more or less “events” than people taking their medicine in the morning.
- Throughout the study, we also collected information about other reasons for hospital admission related to blood pressure (heart failure, glaucoma, and falls).
- We also asked study participants to report if they had experienced any of the following side effects: dizziness/lightheadedness, falls, upset stomach/indigestion, diarrhoea, muscle aches, or excessive visits to the toilet during the day or night.

Schematic of the study



Further research plans

We collected additional information from some study participants on:

- Home blood pressure measurements
- Sleep quality
- Mood
- Chronotype (morning-type vs evening-type)

We will post the results of these additional planned analyses on the study website as they are published and inform participants by email.

Learn more about the study

The results presented in this summary have been published in an academic paper:

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(22\)01786-X/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)01786-X/fulltext)

Click the above link to read them.

If you have any questions about the study, please look at our Frequently Asked Questions page on the TIME study website (www.timestudy.co.uk), or contact the study team at info@timestudy.co.uk. If you have questions about your blood pressure medications, please discuss them with your community pharmacist or GP practice.

To learn more about this study, visit <https://www.isrctn.com/ISRCTN18157641>, where you can access the study registration information.

The TIME study was sponsored by the University of Dundee and funded by the British Heart Foundation (CS/14/1/30659). In addition, the study was supported by the British and Irish Hypertension Society, SHARE, UK Biobank, and UK Clinical Research Networks (UKCRN).

Disclaimer

This summary was completed in September 2022. Newer information since this summary was written may now exist. This summary includes results from one single study. Other studies may find different results.