

**Specific Question:** “In patients taking anti-hypertensive medication does taking the medication (at night) before bedtime as opposed to usual regime, reduce the risk of MI, stroke, postural hypotension and side-effects whilst maximising the therapeutic benefit”

### **Clinical bottom line**

In general, night-time administration of antihypertension medication improves overall 24-hour blood pressure profiles regardless of disease comorbidity. One RCT demonstrated that it also reduced the incidence of cardiovascular events by 50%.

### **Why is this important?**

During hypertension annual reviews, patients in general practice are asking nurses if there is an optimum time to take their blood pressure medication. There has been a lot in the news recently to suggest that it is better to take anti-hypertensive medication at bed time and patients want to know if this is correct.

### **Search timeframe**

Databases searched in Feb 2020.

### **Inclusion criteria**

	<b>Description</b>	<b>Search terms</b>
<b>Population and setting</b>	P= patients taking anti-hypertensive medication	Antihypertensive or ACE inhibitions or CCBs calcium channel blockers or ARB angiotensive receptor blockers or Alpha blockers or Thiazide diuretics or Beta blocker
<b>Intervention or Exposure</b>	I= Chrono therapy (taking medication at night)	Chronotherapy or at night or Nocte or bedtime or evening

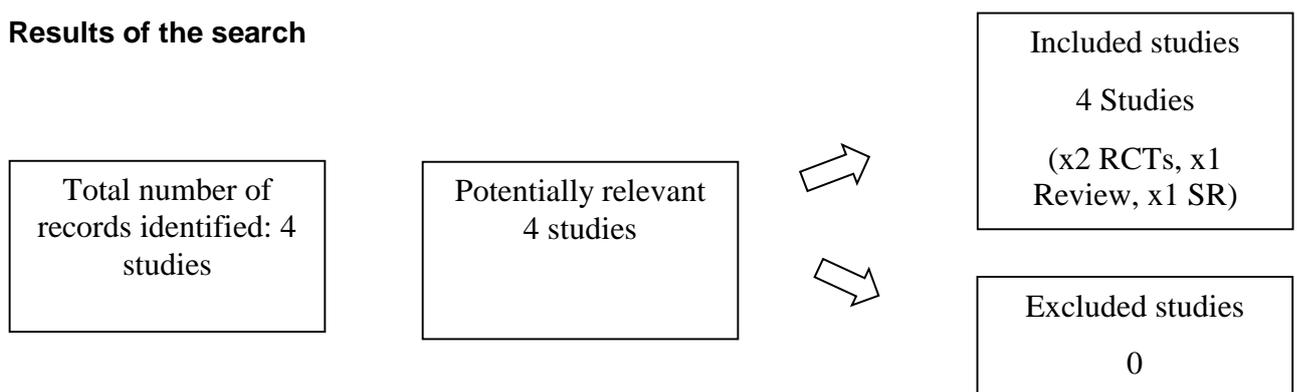
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<b>Comparison, if any</b>	C= usual care, taking at any other time, standard regime, taking in morning	Usual care or standard regime or normal regime or traditional regime or daytime or once a day or daily or as prescribed or as directed
<b>Outcomes of interest</b>	O= avoiding MI, reducing stroke, improving control, reducing hypertension and hypotension, reducing side-effects (dizziness)	Side effects or adverse effects or postural hypotension or unwanted side effects or MI or stroke or reduced falls risk or low blood pressure or normotensive or reduced fractures or reduced falls or TIA or non-compliance or adherence or concordance
<b>Types of studies</b>	Best Evidence	SR and RCTs

**Routine databases searched**

Cochrane systematic reviews, Clinical Evidence, DARE/HTA/NHSNEED, Medline, CINAHL, Cochrane Central, Web of Science, British Nursing Index, Joanna Briggs Institute, TRIP< AHMED, Psychinfo, IBSS (BIDS)

**Results of the search**



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Table 1 – Details of included studies

<b>First author, year and type of study</b>	<b>Population and setting</b>	<b>Intervention or exposure tested</b>	<b>Study results</b>	<b>Assessment of quality and comments</b>
Moola (2019)  JBI Evidence Summary	Participants with hypertension taking anti-hypertensive medication	Chronotherapy	Evening dosing of antihypertensive drugs (alpha blockers and diuretics) is more effective than morning administration to lower 24-hour BP and should be recommended. There is insufficient evidence to determine which of the two regimens may have more beneficial effects on cardiovascular outcomes or adverse events and hence patients' preference should guide treatment in this regard.	Evidence from RCTs and SRs. Quality of evidence not commented on.
Zhao et al (2011)  Cochrane Systematic Review	Participants with hypertension taking anti-hypertensive medication	Chronotherapy	There were no significant differences in overall adverse events and withdrawals due to adverse events among the evening versus morning dosing regimens. In terms of BP lowering efficacy, for 24-hour SBP and DBP, the data suggests that better blood pressure control was achieved with bedtime dosing than morning administration of antihypertensive medication, the clinical significance of which is not known.	High risk of bias around allocation concealment in high number of studies.
Hermida et al, (2019)	Participants with hypertension taking anti-hypertensive medication	Chronotherapy	Routine ingestion by hypertensive patients of >_1 prescribed BP-lowering medications at bedtime, as opposed to upon waking, results in improved ABP control (significantly enhanced decrease in asleep BP and increased sleep time	High quality RCT

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			relative BP decline, i.e. BP dipping) and, most importantly, markedly diminished occurrence of major CVD events (by up to 50%).	
Mohandas and Ejaz (2012)	Participants with type 2 diabetes and hypertension taking anti-hypertensive medication	Chronotherapy	Bedtime chronotherapy appears to be highly effective in controlling blood pressure and lowering cardiovascular risk in patients with diabetes.	High quality RCT

**Implications for Practice**

There is strong evidence in favour of anti-hypertensive medication being taken at night (bedtime), to improve overall blood pressure control and reduce the incidence of cardiovascular events. However, NICE (2020) has produced a patient decision aid on treatment options for hypertension to help people and their healthcare professionals discuss the different types of treatment and make a decision that is right for each person. The NICE guideline also highlights the importance of supporting adherence and ensuring that people with hypertension make the most effective use of their medicines.

There may be a potential health gain in switching to a regimen of taking a total daily dose of antihypertensive medication at bedtime. This seems reasonable to do but we should be cautious if considering this in older people, in those at risk of falls and in those in whom such a change may reduce concordance with medication (for example, those taking anti-hypertensives which may not be suitable for bed time administration, such as diuretics).

**What would you tweet? (140 characters)**

Taking anti-hypertensive medication at night (bedtime) can improve blood pressure control and reduce your risk of a cardiovascular event by up to 50%

## References

Hermida RC et al (2019) Bedtime hypertension treatment improves cardiovascular risk reduction: the Hygia Chronotherapy Trial. *European Heart Journal*, 0,1-12

Mohandas R and Ejaz AA (2012) Evening dosing of antihypertensive medications results in better blood pressure control and decreases cardiovascular morbidity and mortality in patients with Type 2 diabetes. *Evidence-Based Medicine*, 17, 4

Moola S (2019) Hypertension: Evening vs Morning Dosing Regimen Drug Therapy. Evidence Summary. *Joanna Briggs Institute EBP Database*

Zhao P et al, (2011) Evening versus morning dosing regimen drug therapy for hypertension. *Cochrane Database of Systematic Reviews*

NICE (2020) Antihypertension drug treatment: does bedtime administration improve cardiovascular risk reduction. National Institute for Health and Care Excellence; Medicines evidence commentary