The SUSPEND study was a multicentre, randomised, double blind, placebo-controlled trial which looked into the use of drug therapy in the management of symptomatic ureteric stones in hospitalised adults. The study was designed to determine whether the use of medical expulsive therapy (MET) is worthwhile for the NHS in terms of increasing the likelihood of spontaneous stone passage, and being cost-effective compared with standard care without MET.

Two MET drugs were compared, nifedipine and tamsulosin, with a placebo. Adults (18-65 years) who presented for urgent care with severe pain caused by ureteric colic (the term used to describe the pain felt when a stone passes down the ureter from the kidney to the bladder) and suitable for expectant management (an approach where time is allowed to pass before medical intervention or therapy is used) were recruited from 24 NHS trusts.

To be eligible for the study participants had a single ureteric stone of a maximum dimension of <10mm identified by computerised tomography of kidneys, ureters and bladder (CT KUB) and were able to take trial medication. After they had provided informed consent participants were randomised to take tamsulosin (400 µg), nifedipine (30 mg) or placebo once daily for up to four weeks. The medications were over-encapsulated to maintain blinding of participants, clinicians and research staff.

The study team collected data on case report forms and from the participants by getting them to complete questionnaires at the start, and at four weeks and 12 weeks after randomisation.

The primary outcome, spontaneous stone passage, was defined as the lack of need for further intervention to facilitate stone passage at four weeks.

Secondary outcomes of health-related quality of life, pain and number of days of pain relief drug use at four weeks, and estimated time for the stone to pass were also analysed. During the study cost effectiveness over 12 weeks was also examined.

As well as being funded by the NIHR HTA Programme, the study was supported by the NIHR Clinical Research Network. Professor McClinton says: “Invaluable support was provided by the CRN assisting R&D applications and supporting local research teams.”

**Key features**
- June 2010 - October 2014
- A multicentre, randomised, double blind, placebo-controlled trial
- 1,167 participants recruited
- 24 NHS trusts recruited to the study
- Funded by the NIHR Health Technology Assessment (HTA) Programme
- Chief Investigator: Professor Sam McClinton, Consultant Urologist, Aberdeen Royal Infirmary
- NIHR provided support with applications and to local research teams
Outcomes and findings

Between January 2011 and December 2013 1,167 participants were randomised and 1,136 (97 per cent) were included in the primary outcome analysis.

Baseline characteristics between the three study groups were well balanced and similar to those seen in previous published studies, except there was a smaller proportion of women (19 per cent). This was linked to a higher exclusion rate in women, predominantly due to a lack of stones identified using CT KUB.

The results showed that at four weeks, 303 out of 379 (80 per cent) participants in the placebo group had passed their stone compared with 307 out of 378 (81 per cent) allocated to tamsulosin and 304 out of 379 (80 per cent) allocated to nifedipine. There was no evidence that the treatment effects differed across subgroups.

There were no differences between the groups in the visual analogue pain score at four weeks, number of days of pain relief drug use or time to stone passage.

Health status improved in all groups between the start and the four and 12 week time points to reach close to the norm for an age-matched UK general population. There were no differences at any time point between the study groups. There were no differences in cost or gain in quality-adjusted life year (an economic evaluation to assess the value for money of medical interventions) between the groups.

The lack of any differences in the results meant that it would not be considered be cost-effective to use medical expulsive therapy.

Value to the NHS

The results of the SUSPEND study have changed practice among most Urology departments in the UK. It has also lead to changes in the European Association of Urology guidelines for managing ureteric stones. It has led to recommendations to stop the use of medical expulsive therapy being made to GPs and Accident and Emergency doctors.

Two other large studies (one in Australia, one in the USA) have shown similar findings. A collaborative initiative between the three study teams is being submitted for funding. The intention would be to do an individual patient data meta-analysis to try to reach definitive conclusions on the efficacy of medical expulsive therapy.

“"This study really was a practice changer across the UK and internationally. It has helped us define the way we treat urinary tract stones.""

Mr Chris Harding, NIHR Clinical Research Network Sub-Specialty Lead for Benign Urology

Key publications:

- Medical expulsive therapy in adults with ureteric colic: a multicentre, randomised, placebo-controlled trial
  R Pickard et al. 2015; 386: 341-349. The Lancet

- Use of drug therapy in the management of symptomatic ureteric stones in hospitalised adults: a multicentre, placebo-controlled, randomised controlled trial and cost-effectiveness analysis of a calcium channel blocker (nifedipine) and an alpha-blocker (tamsulosin) (the SUSPEND trial)
  R Pickard et al., Health Technol Assess 2015; 19 (63)