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# SOLVE: A trial randomising patients between a medical device (called Dilapan-S) and the standard pessary drug (Propess) to compare them in the process of cervical ripening before induction of labour

**Submission date**
31/05/2017

**Recruitment status**
No longer recruiting

**Registration date**
02/06/2017

**Overall study status**
Completed

**Last Edited**
16/06/2022

**Condition category**
Pregnancy and Childbirth

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

## Plain English summary of protocol

Background and study aims:
Induction of labour (where labour is started artificially) is traditionally carried out with a range of different drugs or by surgery (rupturing the membranes or 'waters'). The first step is to make the cervix (neck of the womb) open up, shorten and soften, which is called ripening. There are different methods that can be used to help ripening. These include a pessary called dinoprostone (or PROPESS) that is placed in the vagina. This provides a hormone that helps to prepare the cervix for labour. This is the standard drug given in the UK, which is effective but can have side effects. In recent years there has been more interest in using non-drug methods of ripening, as these have fewer side effects, but may not be as fast at bringing on labour as drugs. Dilapan-S is a mechanical device, known as an osmotic cervical dilator, which provides an alternative to drugs or surgery. Thin rods of an absorbent material (with no active drug present) are inserted into the neck of the womb (cervix) and, as they absorb fluid, they swell and mimic the natural process of 'ripening' (or preparing) the cervix. This initial process is important before contractions begin. Unlike drugs, Dilapan-S does not cause premature contractions that, when too frequent, may cause the baby to become distressed. The aim of this study is to look at the effectiveness of Dilapan-S compared to standard drug treatment used to induce labour.

Who can participate?
Pregnant women who require labour induction.

What does the study involve?
Women, who agree to take part in the study, are asked to sign a consent form. The person who takes consent then enters the participant details into a telephone system which allocates the participant to either the PROPESS or the DILAPAN-S group. The decision about which group each woman would go into is made by chance, rather like the toss of a coin. Information about labour is collected by the midwife and be kept confidentially. The study collects details of

participant's childbirth experience and any infections acquired whilst in hospital. Participants are also asked to fill in a short questionnaire about the labour experience. There are no further tests or hospital visits connected with this study.

What are the possible benefits and risks of participating?
Women will be offered an induction if they need one, whether they participate in the study or not. The team cannot promise the study will help the woman as an individual, but the answers obtained from this study will help improve the care provided to women requiring induction of labour in the future. There might be other methods available to induce labour at this hospital (e. g. balloon catheter), but these are not being researched in the SOLVE study. Women can experience side effects with PROPESS. The main risk is that contractions become too strong and the baby becomes distressed. This may happen for 1 in 20 women. Women may experience discomfort with the DILAPAN-S, and there may be a small risk of infection (1 in 100 000 women). There is also a rare risk of the pessary or rod(s) becoming trapped in the vagina or cervix, fragmenting on removal, or retracting in to the uterus (5 in 100 000 women). Should this happen the doctor may need to use forceps, or other intervention, to help remove them. All women taking part will be assessed by their doctor who will decide if they need to remain in hospital, whilst being induced, or are able to go home. If a participant needs to stay in hospital they will be monitored by a midwife.

Where is the study run from?
University of Birmingham (UK)

When is study starting and how long is it expected to run for?
February 2016 to December 2021 (updated 11/02/2021, previously: March 2021)

Who is funding the study?
MEDICEM International CR s.r.o (UK)

Who is the main contact?
Amanda Cotterill, a.cotterill.2@bham.ac.uk

# Contact information

### Type(s)
Public

### Contact name
Ms Amanda Cotterill

### Contact details
SOLVE Trial Manager
University of Birmingham Public Health Building
Edgbaston
Birmingham
United Kingdom
B15 2TT
+44 (0)7795 303 779
solve@trials.bham.ac.uk

### Type(s)

Scientific

### Contact name
Ms Amanda Cotterill

### Contact details
SOLVE Trial Manager
University of Birmingham Public Health Building
Edgbaston
Birmingham
United Kingdom
B15 2TT
+44 (0)7795 303 779
solve@trials.bham.ac.uk

## Additional identifiers

### Clinical Trials Information System (CTIS)
2016-004726-42

### ClinicalTrials.gov (NCT)
NCT03001661

### Protocol serial number
33330

## Study information

### Scientific Title
Randomised controlled trial on the use of synthetic osmotic cervical dilator in induction of labour in comparison to dinoprostone vaginal insert

### Acronym
SOLVE

### Study objectives
The aim of this study is to compare cervical ripening using Dilapan-S with the standard use prostaglandin drug.

### Ethics approval required
Old ethics approval format

### Ethics approval(s)
East Midlands - Leicester Central Research Ethics Committee, 15/02/2017, ref: 17/EM/0011

### Study design
Randomised; Interventional; Design type: Treatment, Drug, Device

### Primary study design
Interventional

## Study type(s)
Treatment

## Health condition(s) or problem(s) studied
Childbirth

## Interventions
After all eligibility criteria have been confirmed and informed consent has been received, the participants can be randomised into the SOLVE trial. This will be as close as possible to induction of labour commencing. Participants will be randomised in a 1:1 ratio to one of two groups.

Group 1: Dilapan-S® (synthetic osmotic cervical dilator device) rods are intended for single and continuous use for no more than 24 hours. In the group randomly assigned to the device (via a telephone randomisation line), the cervix is visualised with a sterile vaginal speculum and cleaned with iodine. Up to a maximum of five rods are inserted into the cervical canal under direct visualisation during a sterile speculum examination. Women with no maternal or fetal risk, and compliant with instructions for out-patient cervical ripening, can be discharged for home cervical ripening with respect to hospital clinical policy and invited for hospitalisation next morning for their removal. For the purpose of the trial, the rod(s) shall remain in place for up to 24 hours, but checked after 12 hours. If cervix remains unfavourable after the first series of dilators has been used for the 24 hour time period, this first series of rods will be extracted and a second series of dilators will be inserted to continue cervical ripening for up to an additional 24 hours. Once removed, there is no need for further follow-up of the patient, other than for SAEs.

Group 2: Propess® 10mg vaginal delivery system consists of a non-biodegradable polymeric drug eluting device delivering 10mg dinoprostone (Prostaglandin E2) by slow release. In the group randomly assigned to dinoprostone (via a telephone randomisation line), one system will be administered high up into the posterior vaginal fornix using only small amounts of water soluble lubricants to aid insertion. After the vaginal delivery system has been inserted, the withdrawal tape may be cut with scissors always ensuring there is sufficient tape outside the vagina to allow removal. The woman should be recumbent for 20 minutes to 30 minutes after insertion. As dinoprostone will be released continuously over a period of 24 hours. If there has been insufficient cervical ripening by 24 hours, the same (initial) vaginal delivery system can be left in place for another 8 hours i.e. 32 hours in total, if this is local policy. Following this period the initial vaginal delivery system should be removed, and there should be a 24 hour interlude. If the 24 hour interlude has been reached without contractions starting, a second system of Propess can be administered and left in place for a further 32 hours (i.e., 24 + 8 hours) if there is still insufficient cervical ripening effect. Once removed, there is no need for further follow-up of the patient, other than for SAEs.

There will be no follow-up of patients in the SOLVE Trial, as the intervention and data collection happen whilst the woman is in hospital (from induction to delivery). The only point at which follow-up may occur is if there is an SAE. In this case SARs/SAEs still present beyond 14 days post-partum must be followed up until the final outcome is determined.

## Intervention Type
Device

## Phase
Not Applicable

## Primary outcome(s)

Current primary outcome measure as of 05/11/2020:
Efficacy of the synthetic osmotic cervical dilator in cervical ripening, prior to Induction of Labour (IoL), in comparison to dinoprostone vaginal insert to successfully achieve vaginal delivery as recorded on the Baseline and Birth Case Report Form (CRF) for the trial.

Previous primary outcome measure:
Efficacy of the synthetic osmotic cervical dilator in cervical ripening, prior to Induction of Labour (IoL), in comparison to dinoprostone vaginal insert to successfully achieve vaginal delivery within 36 hours as recorded on the Baseline and Birth Case Report Form (CRF) for the trial.

## Key secondary outcome(s))

Current secondary outcome measures as of 10/07/2020:
Previous secondary outcome measures:
1. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on successful vaginal delivery within 24, 36 and 48 hours as recorded on the baseline and Birth Case Report Form (CRF) for the trial
2. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on rates of caesarean section, as recorded on the baseline and Birth Case Report Form (CRF) for the trial at the point of delivery of the fetus
3. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on gain in Bishop Score, as recorded on the baseline and Birth Case Report Form (CRF) for the trial at the point of insertion of the device/drug (baseline) and at the point of removal of the drug/device once cervical ripening is complete (for the device this will be 12 or 24 hours, for the drug this will be 24, 32, 56 or 64 hours)
4. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on maternal and neonatal safety as reported on the baseline and Birth Case Report Form (CRF) for the trial and the Serious Adverse Event (SAE) form, which will be monitored from baseline until discharge from hospital (or until resolution of an SAE)
5. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on maternal satisfaction with cervical ripening as reported on the Maternal Satisfaction Questionnaire administered post-delivery and prior to hospital discharge
6. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on fetal status after delivery as reported on the baseline and Birth Case Report Form (CRF) for the trial and the Serious Adverse Event (SAE) form, which will be monitored from baseline until discharge from hospital (or until resolution of an SAE)

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Previous secondary outcome measures:
1. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on successful vaginal delivery within 24 and 48 hours as recorded on the baseline and Birth Case Report Form (CRF) for the trial
2. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on rates of caesarean section, as recorded on the baseline and Birth Case Report Form (CRF) for the trial at the point of delivery of the fetus
3. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on gain in Bishop Score, as recorded on the baseline and Birth Case Report Form (CRF) for the trial at the point of insertion of the device/drug (baseline) and at the point of removal of the drug/device once cervical ripening is complete (for the device this will be 12 or 24 hours, for the drug this will be 24, 32, 56 or 64 hours)
4. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison

to dinoprostone vaginal insert on maternal and neonatal safety as reported on the baseline and Birth Case Report Form (CRF) for the trial and the Serious Adverse Event (SAE) form, which will be monitored from baseline until discharge from hospital (or until resolution of an SAE)
5. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on maternal satisfaction with cervical ripening as reported on the Maternal Satisfaction Questionnaire administered post-delivery and prior to hospital discharge
6. Response to a synthetic osmotic cervical dilator in cervical ripening, prior to IoL, in comparison to dinoprostone vaginal insert on fetal status after delivery as reported on the baseline and Birth Case Report Form (CRF) for the trial and the Serious Adverse Event (SAE) form, which will be monitored from baseline until discharge from hospital (or until resolution of an SAE)

### Completion date
06/02/2021

## Eligibility

### Key inclusion criteria
Current inclusion criteria as of 05/11/2020:
1. Women >16 years of age
2. Able to provide informed consent
3. Singleton pregnancy
4. Indication for IoL
5. Pregnancy ≥37.0 weeks (assessed as an agreed gestational age by ultrasound dating scan)
6. Living fetus with vertex presentation
7. Intact membranes

Previous inclusion criteria:
1. Women aged 16 years and over
2. Understanding and capable to provide informed consent
3. Singleton pregnancy
4. Indication for IoL
5. Pregnancy ≥37.0 weeks (assessed as an agreed gestational age by ultrasound dating scan at 11-14 weeks)
6. Living fetus with vertex presentation
7. Intact membranes
8. Bishop Score ≤6 points

### Participant type(s)
Patient

### Healthy volunteers allowed
No

### Age group
Adult

### Lower age limit
16 years

### Sex
Female

### Total final enrolment
674

### Key exclusion criteria
Current exclusion criteria as of 05/11/2020:
1. Women already receiving oxytocin
2. Diagnosis of fulminant preeclampsia/eclampsia
3. Contraindication to Dinoprostone or Dilapan
4. If Dinoprostone for loL is non-compliant with local policy
5. Enrolled in other randomised controlled trials of an IMP or device for cervical ripening or induction of labour

Previous exclusion criteria:
1. Contraindication for vaginal delivery (i.e., placenta previa)
2. When labour has already started (defined as regular painful contractions)
3. When oxytocin is being administered
4. Fulminant preeclampsia/eclampsia
5. Clinical signs of uterine, cervical, vaginal or vulval infection (except Group B Streptococcal colonisation)
6. Known allergy or contraindication to drug or device ingredients
7. Previous uterine body/midline/classical caesarean section (EXCEPT lower segment caesarean section)
8. More than one previous caesarean section
9. Known uterine abnormality
10. Suspected fetal hypoxia (i.e., CTG recording evaluated as abnormal prior to pre-induction initiation)
11. Unstable lie
12. Active antepartum haemorrhage at the time of induction
13. Four or more full-term deliveries
14. Known fetal anomalies

### Date of first enrolment
30/06/2017

### Date of final enrolment
27/01/2021

## Locations

### Countries of recruitment
United Kingdom

England

### Study participating centre
### City Hospital Birmingham
Dudley Road
Birmingham

United Kingdom
B18 7QH

**Study participating centre**
**Heartlands Hospital**
Bordesley Green East
Birmingham
United Kingdom
B9 5SS

**Study participating centre**
**Birmingham Women's and Children's Hospital**
Mindelsohn Way
Edgbaston
Birmingham
United Kingdom
B15 2TG

# Sponsor information

**Organisation**
Birmingham Women’s and Children’s NHS Foundation Trust

**ROR**
https://ror.org/056ajev02

# Funder(s)

**Funder type**
Industry

**Funder Name**
MEDICEM International CR s.r.o

# Results and Publications

**Individual participant data (IPD) sharing plan**

The current data sharing plans for the current study are unknown and will be made available at a later date.

## IPD sharing plan summary

Data sharing statement to be made available at a later date

## Study outputs

| Output type | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|---|---|---|---|---|
| Basic results | | 28/10/2021 | 16/06/2022 | No | No |
| HRA research summary | | | 28/06/2023 | No | No |
| Participant information sheet | version V2 | 10/02/2017 | 02/06/2017 | No | Yes |
| Participant information sheet | version v4.0 | 02/08/2018 | 10/07/2020 | No | Yes |
| Participant information sheet | version v3.0 | 10/10/2017 | 05/11/2020 | No | Yes |
| Participant information sheet | Participant information sheet | 11/11/2025 | 11/11/2025 | No | Yes |
| Study website | Study website | 11/11/2025 | 11/11/2025 | No | Yes |