The AHSN Network

PReCePT Programme Implementation Guide V 2.0

Contents

Introduction

This guide supports the implementation of PReCePT in maternity and neonatal units and is designed for use in conjunction with the PReCePT Quality Improvement Toolkit. It is based on the experience of the first PReCePT project, which successfully embedded the administration of magnesium sulphate to eligible preterm mothers across five units in the West of England. This intervention has been proven to be an effective neuroprotectant for babies delivered prematurely by reducing infant mortality and cerebral palsy (Crowther 2017).

The national adoption and spread of this intervention, funded by NHS England, is led by the West of England Academic Health Science Network (AHSN) who are supporting the other 14 AHSNs to implement and embed the administration of magnesium sulphate in all maternity units across England.

The key elements of the PReCePT initiative are designing and implementing a highly reliable process for administering magnesium sulphate and creating extensive awareness through training on why, how and when to give magnesium sulphate to preterm mothers within maternity units. The evaluation from the original West of England PReCePT project was published in an article in BMJ Open Quality and provides a helpful insight into the detail of the initial project (Burhouse et al 2017).

This implementation guide, the accompanying PReCePT Quality Improvement Toolkit and the materials within them can be used as an entire package or as individual component parts to allow for customisation at a regional or local level with specific reference to clinicians, managers, commissioners and trainers in secondary and tertiary care. The guide also provides information and links to resources on change management and quality improvement methodologies.

All resources can be found on the AHSN National website at:
www.ahsnnetwork.com/precept/

It may be helpful to take a look at the "What is QI?" section on the West of England AHSN website: www.weahsn.net/matneoqi

There is also a video, "A general Introduction to Quality Improvement in 4 objects", on YouTube that explains quality improvement through the use of four everyday objects; it is short and maternity specific:
https://www.youtube.com/watch?v=Rk5wHFmAthA&feature=youtu.be

Acknowledgements

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The PReCePT Programme

The aim of the PReCePT Programme, which runs from 2018 to 2020, is to increase the numbers of eligible women offered magnesium sulphate to prevent cerebral palsy in preterm babies from the England average of 43% to at least 85% nationally with minimal variation. Maternity and neonatal units who are already achieving 85% are expected to progress to the stretch target of administering magnesium sulphate to 95% of eligible mothers matching the top performing units. Reaching this target will match the England average uptake of magnesium sulphate with current levels of antenatal steroid administration in eligible women.

National picture

There is a wide range of uptake of administration of magnesium sulphate to eligible mothers in preterm labour across England, with significantly lower average uptake in the United Kingdom than in some other countries.

In 2016 the recording of magnesium sulphate administration into the national BadgerNet database became a mandatory field providing a clear picture of compliance. Organisations are able to monitor their own performance via the output from this database locally. The introduction of clinical guidance from NICE in 2015, (NG25), also promoted the use of magnesium sulphate and monitoring of effectiveness via NICE quality standards became another driver for success. The output from BadgerNet is also reported via the National Neonatal Audit Programme (NNAP) in their annual report. This can be accessed here www.rcpch.ac.uk/work-we-do/quality-improvement-patient-safety/national-neonatal-audit-programme-nnap

The above initiatives all serve to raise awareness of the body of evidence for practice change with clinicians, parents, operational managers and chief executives. Tertiary maternity and neonatal units who frequently care for mothers in preterm labour may have greater exposure to opportunities to embed this clinical practice in comparison to smaller units who will infrequently care for women in preterm labour. It is imperative that all maternity and neonatal units, large or small, are cognisant of this clinical intervention and feel confident and competent to embed the administration of magnesium sulphate for preterm mothers where indicated.

Equally, it is vital that the organisational culture is such that it welcomes change and allows the safe constructive challenge of variation in practice without negative consequences for staff or mothers and their babies.

The PReCePT programme provides materials and support to raise awareness, for education, training and knowledge sharing that are essential for successfully implementing this intervention. The Driver Diagram (Appendix 3) summarises the detail within this guide).

Part 1: Engagement and Awareness Raising

The "Get Ready for PReCePT" Checklist (Appendix 1) will assist in identifying the current readiness of the AHSN/maternity and neonatal unit. The content below is designed to support the set-up phase of the project and ensure AHSNs and maternity and neonatal units are well positioned to Go Live with the PReCePT Programme.

A second Checklist "Are you Ready for PReCePT?"(Appendix 2) may be useful as a final check prior to Go Live. Both checklists are available to download from the AHSN Network website alongside the other PReCePT materials.

1.1 "Right people, right place, right time"

This section outlines the recommended personnel to create a team within AHSNs, maternity and neonatal units and Neonatal Operational Delivery Networks. It is based on the experience of the first PReCePT project, which improved uptake rates of administration of magnesium sulphate from an average baseline of 21% to 88% between 2014 and 2016 in five maternity and neonatal units in the West of England.

Academic Health Science Network Project Team

1. **Quality Improvement Lead:** Each AHSN is funded for 0.2 WTE quality improvement lead for the PReCePT Programme.
2. **Regional Neonatal Lead:** This role is funded for one PA per week, or equivalent, for each Neonatal Operational Delivery Network (ODN). The AHSN will provide training and support for this role. In addition each Regional Neonatal Lead will be supported with regular coaching from the National Clinical Lead for PReCePT, Dr Karen Luyt. In some areas the geographical boundaries are not aligned and in such cases it may be pragmatic to create a shared role. Such decisions should be made locally taking into account the regional context, resources and capability.
3. **Project support:** This should be determined locally although it may be helpful to align this with support provided to the AHSN Maternal and Neonatal Health Safety Collaborative team.

Maternity and Neonatal Unit Team

1. **Midwife Lead:** This role is supported with funding from the PReCePT Programme for 90 hours over 6 months. However, each unit can create a local training plan that may influence how the Midwife Lead role is deployed. Some units may favour a role with less time allocation per week but spread the resource over a longer period; others may wish to incorporate the role into existing teaching and support roles. It is envisaged that each AHSN will develop a support mechanism for Midwife Leads in their region. This may be a

face-to-face or virtual group and serve to share learning and progress as well as maintain motivation and interest in the programme.

2. **Obstetric Lead Role:** Administration of magnesium sulphate is a core element of the pathway for the mother in preterm Labour. At this point the Obstetrician is responsible for the care of the mother with support from Midwives and Neonatal clinicians. The role outline in Section 4 of the PReCePT QI Toolkit describes this role.
3. **Other supporting roles:** Clinical leads for the Maternal and Neonatal Health Safety Collaborative, (MNHSC), leads for the National Maternity Transformation Programme, Maternity Safety Champions, Heads of Midwifery and Clinical Directors are key roles that will support the implementation of the PReCePT Programme. Unit teams should identify the personnel involved and seek to create an effective relationship, sharing learning to avoid duplication. Research Midwives and Midwife Lecturer Practitioner roles are ideally placed to support transformational change and their experience and expertise should be sought wherever possible.

1.2 Executive Sponsorship

The evaluation from the original West of England PReCePT project, (Burhouse et al 2017), highlighted the benefits of engaging Executive Sponsorship for each maternity and neonatal unit/Trust. In most cases this may be the Executive responsible for supporting the MNHSC often the Director of Nursing/Midwifery. The purpose of this sponsorship is to promote the PReCePT Programme at a senior level as well as influencing and negotiating to achieve 85% uptake progressing to the stretch target of 95% by March 2020.

1.3 Key Relationships

The AHSN Project team and local maternity and neonatal unit teams will need to work collaboratively to socialise the PReCePT Programme within the Neonatal Operational Delivery Network, (ODN), and Maternity Clinical Networks fostering effective working relationships across the region.

1.4 Alignment with National Context

The National Maternity Transformation Programme and the Maternal and Neonatal Health Safety Collaborative, (MNHSC), are key enablers and vehicles for communication, disseminating learning and collaborating to ensure the overall aim of improving outcomes for mothers and babies is achieved.

The MNHSC launched in February 2017 and is a three-year programme. It is led by the National Health Service Improvement Patient Safety Team and covers all maternity and

Part 1: Engagement and Awareness Raising

neonatal services across England. The aim of the collaborative is to:

1. Support maternal and neonatal care services to provide a safe, reliable and quality healthcare experience to all women, babies and families across maternity and neonatal care settings in England
2. Create the conditions for continuous improvement, a safety culture and a national maternal and neonatal learning system
3. Contribute to the national ambition of reducing the rates of maternal and neonatal deaths, stillbirths, and brain injuries that occur during or soon after birth by 20% by 2020.

The collaborative was announced by the Department of Health in October 2016 and supports the aims of the NHS England's Better births maternity review . The National Maternity Transformation programme which has nine workstreams, covering a range of topics. The Maternal and Neonatal Health Safety Collaborative falls under Workstream 2: Promoting good practice for safer care.

Understanding regional and local quality improvement programmes currently underway or planned in your area/unit is key to capitalise on local skills, avoid confusion and to maintain strong engagement. Local Learning Systems, (LLS), bring together members of the Patient Safety Collaboratives, AHSNs, Maternity Clinical Networks and Neonatal ODNs with maternity and neonatal clinicians. These are linked to the Local Maternity System and will provide:

- a forum for local improvement to thrive
- an opportunity for all network partners to work collaboratively
- effective collaboration between local partners
- opportunities for system level improvement
- an opportunity for increasing local improvement capability
- a sustainable solution for maternal and neonatal improvement.

The PReCePT Programme approach encourages regional and local collaboration fostering key relationships and sharing learning, knowledge and experience in an iterative manner. It is advisable to discuss PReCePT with the regional Maternity Clinical Network, Neonatal ODN, local MNHSC and other local stakeholders considering how the Local Learning System and Strategic Clinical Networks can support the implementation of the PReCePT pathway and its longer-term sustainability.

Findings from the initial PReCePT work, (Burhouse et al 2017), suggested a three-month preparatory period is advantageous prior to commencing the PReCePT programme. This set up phase should ensure a smooth Go Live transition in each unit.

Part 1: Engagement and Awareness Raising

1.5 Co-creation & Stakeholder Involvement

Regional, AHSN and unit level co-production is a model of collaborative working that fosters key relationships and shares learning, knowledge and experience. This should involve third sector groups and local support groups for mothers and groups who focus on ante/post-natal care. The first PReCePT project included extensive co-creation thus further involvement is optional as the results from the first project demonstrate the materials are effective particularly with regard to the Parent Information Leaflet (See Part 2 of this guide).

1.6 Communication Plan

The West of England AHSN, as the lead AHSN for the PReCePT Programme, has developed a communications plan that involves the following:

- Regular briefings to AHSN PReCePT Leads
- Monthly briefings to AHSN Managing Directors & Improvement Directors
- Regular reports to NHS England, Maternity Transformation Programme Board and NHS Improvement.

Each AHSN and maternity and neonatal unit may wish to develop a communications plan for use regionally and/or locally. This should include regular updates to the Executive Sponsor, the local AHSN and other maternity and neonatal units in their region. The PReCePT Dashboard

provided within the PReCePT QI Toolkit (Section 2) provides a poster demonstrating monthly progress with magnesium sulphate administration as well as training uptake that, with the addition of a cover sheet, may meet this need.

1.7 Case Study

The case study outlined below highlights how vital this intervention is. This narrative brings to life the benefits that administration of magnesium sulphate can bring and the impact it can have on the lives of mothers, babies, wider family and friends, in the early years and beyond.

PReCePT impact: Ellie and her son Cormack

Cormack was born at 27 weeks gestation.

He was the first baby to benefit from magnesium sulphate neuroprotection in Bristol.

Cormack was cared for in Neonatal Intensive Care, Bristol.

Cormack is now a fit and healthy 5 year-old

Part 2: Knowledge Mobilisation Phase

(Refer to PReCePT QI Toolkit Section 1 Clinical Information)

2.1 PReCePT QI Toolkit: The component parts

("Essential" identifies resources that are core to the PReCePT Programme. Some resources are "strongly recommended" and some are optional. Resources labeled as "adaptable" may be edited locally).

a) PReCePT Evidence & Key Research Paper (Essential)

This outlines the benefits of administering magnesium sulphate to eligible mothers in preterm labour. Key references are listed with a summary of a paper from Crowther et al, (2017) which builds upon the original paper written by Crowther et al (2009), reaffirming that antenatal magnesium sulphate acts as a fetal neuroprotector and reduces the risk of cerebral palsy.

The papers are available here:

1. Crowther et al (2017) www.ncbi.nlm.nih.gov/pmc/articles/PMC5627896/
2. Crowther et al (2009) https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-13-91

b) PReCePT Clinical Guidance for the Management of Suspected Preterm Labour (Essential)

This clinical decision flowchart details the clinical activities required to ensure magnesium sulphate is an integral element of the antenatal pathway for mothers in preterm labour. It incorporates other essential elements of care such as preterm steroid administration. This should be available for display and/or use within the clinical environment when used in accordance with local infection control guidelines.

c) PReCePT Magnesium Sulphate Quick Reference (Essential)

This one side of A4 summarises the administration of magnesium sulphate, both loading dose and ongoing maintenance regimen, and is created with large font to facilitate display in clinical areas when used in accordance with local infection control guidelines.

d) PReCePT Initial Management of Preterm Labour Proforma (Optional)

The proforma was developed during the first PReCePT project and provides the facility for accurate and easy completion of the clinical record. It is based on an existing clinical record proforma and also serves as a prompt to administer magnesium sulphate when appropriate. Such details can be added to maternity and neonatal unit preterm labour clinical documentation/care pathway at a local level if permitted.

Organisations that use a full electronic patient record may wish to review how this can be incorporated into existing electronic records. This may be an area for collaboration with other units who use the same information technology systems.

Care should be taken to ensure the mothers' handheld records are also modified to reflect the intervention.

e) PReCePT Dashboard (Strongly recommended)

This is an excel spreadsheet where local compliance with the clinical guideline and numbers of staff trained is entered. This input generates an A4 poster to visually demonstrate progress by highlighting the compliance with the magnesium sulphate pathway as recorded in BadgerNet, the number of staff trained with details of unit uptake rate and trend.

Please note the PReCePT Programme focuses on the administration of Magnesium sulphate to mothers less than 30 weeks gestation. Maternity and neonatal units that wish to include all mothers up to 33+6 weeks gestation may use it up to 33+6 weeks. Units using less than 30 weeks gestation should include data on mothers less than 30 weeks gestation.

Maternity and neonatal units should be clear from the outset of their improvement journey which gestational target group they are including to ensure the data and subsequent run charts produced are consistent and can be reviewed accordingly.

It may be beneficial for this decision to be made at a regional level if units within the region wish to compare performance against each other.

f) PReCePT Parent Information Leaflet (Essential and adaptable; refer to PReCePT QI Toolkit Section 3)

The leaflet was co-designed with extensive parent involvement and input from Bliss, (www.bliss.org.uk) and those involved are still engaged in the PReCePT Programme four years on. It provides information to support decision-making and the process of gaining informed consent for parents at a critical time.

It is highly recommended that the leaflet is used with the current content unchanged. It is available on the national AHSN website within the QI Toolkit, as well as a standalone download with an option to insert your local trust name and logo.

g) PReCePT Learning Log (Optional. Refer to PReCePT Training Model in Part 3)

This is the method of using Plan, Do, Study, Act cycles to develop and record effective practice within the unit. A learning log can serve as a useful additional to reporting in collating 'lessons

learned'.

h) PReCePT Training Presentation (Essential and adaptable)

A generic training presentation is available from the AHSN website which can be edited according to the audience it is being delivered to or used with. The evaluation of the first PReCePT project demonstrated that a "lighter" shorter version was advantageous when delivering teaching in the clinical environment hence "micro" teaching, (using digital tablet devices), has been advocated as one of the most effective methods of training clinical staff.

i) Enabling Role Descriptions

I. PReCePT Midwife Lead Role (Essential)

This role description outlines the role of the Midwife in each maternity unit. It is supported with backfill funding to enable teaching and local data monitoring and duration of the role can be determined locally to achieve the greatest impact. Recruitment should follow local Trust process and candidates should have experience of change management and be clinically credible with their colleagues.

II. PReCePT Regional Neonatal Lead (Essential)

This outlines the Neonatal Lead at AHSN/ODN level. It is supported with backfill funding and duration of the role can be determined locally. Strong relationships with maternity and neonatal units within the regions are key to supporting the PReCePT programme.

III. PReCePT Obstetrician Lead Role (Essential)

A key leadership role within each unit and is vital to achieving success with the administration of magnesium sulphate to all eligible pre-term mothers.

2.2 The PReCePT Training Model

The PReCePT programme includes funding for a Lead Midwife role within each unit. This is to support staff to implement and embed the practice of offering magnesium sulphate to all eligible mothers. Each unit can determine locally how best to use this backfill funding, e.g. one day per week for 12 weeks or ½ day per week for 24 weeks or a combination. Within all units there will be harder to reach staff due to shift patterns, working hours. Flexibility and creativity are key to ensure all staff have access to the training and can gain the appropriate level of knowledge for their role.

From experience the most effective model of training was "micro" teaching. This is where the Lead Midwife holds a small teaching session, at handover, or during the clinical shift, for one

member or a few staff at a time. In some areas teaching opportunities were already in place and PReCePT training was incorporated into these sessions.

The PReCePT training presentation is available from the national AHSN website and is compatible with digital tablet devices. This has been developed to support units to empower and teach all staff the underpinning principles for why this initiative is so important. It is designed to be tailored to meet the needs of particular audiences and the time available for training. For example, some groups may favour the more practical elements of the toolkit whereas others may wish to discuss the evidence base in more detail.

Maternity and neonatal units will design their own training plan including who will deliver the training, who should be trained, (whether to target groups or individuals depending on local workforce arrangements), how to train e.g. whether micro "tea trolley" training is preferable to planned teaching sessions or a combination of methods.

It is recommended that training records are kept at a local unit level with regional AHSNs collating an overall picture across their footprint. The output from this will form part of the national evaluation and therefore a reliable method of recording numbers trained per region is required. Life QI may be useful for this purpose.

Life QI is a web-software platform built to support and maintain quality improvement (QI), work in health and social care. The software makes it easy for teams to run quality improvement projects and enables organisations to report on QI activities. Most AHSN Patient Safety Collaboratives are using Life QI as the platform for recording and sharing data. Please ask the AHSN PReCePT QI Lead for further information (www.lifeqisystem.com; help@lifeqisystem.com).

The PReCePT lanyard and attached laminated guidance evaluated extremely well and was the most successful from the suite of aide memoirs available. It provides a "pocket" size reference to the clinical guideline as well as promoting the PReCePT Programme visually. An initiative that worked well in the first PReCePT project was the provision of the laminated guideline on the "PReCePT" lanyard on completion of the training session. The presence of a bright branded lanyard was easily identifiable and at a glance on a shift it was possible to identify who had completed training.

The text for the pocket size guide and template are available on the national AHSN website with the other PReCePT materials. (Local infection control policies and risk governance may not permit the wearing of neck lanyards thus please check with local unit policy).

Each unit/AHSN will develop a training model that meets the needs of their local area and workforce.

Part 2: Knowledge Mobilisation Phase

2.3 Learning from staff training models used in the first PReCePT project:

1. Useful learning and feedback was gained from exploring cases where magnesium sulphate was not given thus building time to do this detailed audit may be useful. It assisted the understanding of local assumptions and of the clinical care delivered.
2. Incorporating suggestions on how to deal with emergency situations was built into the training.
3. Training approach – it was useful to discuss which groups to target for training and any subgroups which support this intervention. Some units trained all. registered midwives and others focused on key staff such as shift co-ordinators. This should be determined locally.
4. Training night duty staff should be planned carefully to ensure opportunities are provided fairly and at appropriate times.
5. Locum and agency staff can be challenging to train in terms of availability and frequency of working patterns in the same unit. Consideration should be given as to how best to ensure their learning needs are incorporated in to the local training model.
6. QI skills gaps - who will determine this and how will it be captured and recorded.
7. Data entry training for midwives may be required in order to ensure accurate recording of magnesium sulphate and any reasons why it was not administered.
8. QI training may be required for Midwife Leads and other key personnel to support successful implementation and local evaluation of progress with training, knowledge gain and embedding this change in practice.
9. Local agreement on when rapid cycle test of change are required using the Plan, Do, Study, Act are required and how they are shared within Life QI should be clearly articulated with access to the Life QI Project group given where available to individuals/ groups.

2.4 The PReCePT Learning Log

This is the record of improvement activity carried out during the implementation of the PReCePT Programme in the maternity and neonatal unit (refer to PReCePT QI Toolkit Section 4). Instructions are provided in the PReCePT QI Toolkit and the information gained can be recorded within LifeQI. Using LifeQI to record this activity provides a record that is visible to all participants and can aid the dissemination of learning across all AHSNs.

It is recommended that each AHSN develops a process for collating information on the aspects

listed below to support evaluation of the PReCePT Programme as well as the ability of AHSN's to deliver a national adoption and spread programme.

Key elements to include are:

- Numbers of staff trained (by professional group)
- How professional groups were identified for testing training methods
- Local knowledge of magnesium sulphate and the benefits/use in preterm labour.

2.5 Feedback on progress

Simple feedback tools such as the Ask 5 Tally, (Appendix 4), may be of benefit here and are a quick and easy method of assessing progress and a key opportunity to share learning with colleagues across the AHSN network using LifeQI.

2.6 Support for Midwife Leads

Each AHSN will develop a mechanism for supporting the Midwife Leads in their region. This may be via face-to-face meetings, teleconference calls, via Life QI, virtual networks or communities of practice as well as coaching individually or as part of a group or action learning set. The use of buddying system to create opportunities for sharing as well as peer support is also encouraged.

Part 3: Enablers

3.1 PReCePT Aide Memoirs & Posters

To support successful implementation of this initiative several aide memoirs have been developed over the course of the programme.

a) PReCePT magnet system (Optional)
b) Lanyards & laminated guidance (Optional)
c) Pens (Optional)
d) PReCePT Infographic Poster (Essential)
e) PReCePT Think Magnesium Sulphate Too Poster (Strongly recommended)
f) PReCePT Dashboard Poster (Strongly recommended).

Instructions and contact details of how to download or order the above are available on the AHSN Network website as well as via your local AHSN PReCePT Programme Lead.

One of the key aids that evaluated very positively in the initial PReCePT project is the use of a magnet on the ward patient board to identify the mothers who are eligible for magnesium sulphate. This follows the principles of "Status at a Glance" as promoted in the Productive Ward Programme led by the NHS Institute for Innovation and Improvement (2012). Magnets can be used to visually prompt obstetricians and midwives to administer magnesium sulphate to women who will give birth prematurely with the aim of reducing the risk of their infant developing cerebral palsy.

The PReCePT Infographic and the PReCePT 'Think Magnesium Sulphate Too' Posters are visual aide memoirs available to download from the AHSN website and are useful additional methods of disseminating the rationale for the PReCePT programme. They promote the initiative to staff and parents alike through display throughout the unit/on the ward.

The PReCePT Dashboard Poster is generated from the PReCePT Dashboard Excel spreadsheet. This provides a highly visual graphic of progress (Refer to Part 2e.)

3.2 Implementation

Each AHSN will design their project plan according to the local context recognising the number of maternity and neonatal units involved, the current baseline of magnesium sulphate administration, and local readiness.

The appointment of the key lead roles for the programme is a key milestone to achieve. Once local lead roles are in place AHSNs will support teams to understand their baseline data, assess their quality improvement capability and capacity and progress towards developing an

achievable timeline for a Go Live date.

The number of maternity and neonatal units in each region and their baseline performance with regard to administration of magnesium sulphate will determine the speed of progress; Units, which are close to or above 85% and progressing to achieving 95% uptake of magnesium sulphate administration to eligible mothers, will require a different delivery strategy to those who are at lower rates of magnesium sulphate administration.

Local training requirements should be assessed and plans developed collaboratively across the project team and professional groups to ensure all key personnel are briefed and aware of the project.

It may be necessary for maternity units to refresh local policies and guidelines across their maternity and neonatal teams and clinical practice documents to ensure consistency of clinical practice and to support local governance arrangements.

Maintaining motivation and interest in the project is key to success and embedding this improvement in clinical practice. The local culture and context will determine how best this is achieved in each maternity and neonatal unit.

The "Are you Ready for PReCePT?" Checklist, (Appendix 2) will help to assess readiness for change prior to Go Live with the PReCePT Programme

Part 4: Behaviour Change

The overall aim of the PReCePT Programme is to prevent the risk of Cerebral Palsy in preterm babies by achieving the goals of:

1. Every maternity unit in England administering magnesium sulphate to eligible mothers in preterm labour to achieve 85% uptake
2. Increasing the uptake rate of 85% to 95% in all maternity units in England by April 2020.

4.1 Knowing How You Are Doing - Baseline Measurement

The National Neonatal Audit Programme Report (2017) provides details of the annual performance in each unit with regard to administration of magnesium sulphate to eligible preterm mothers. At local level it is usually neonatal clinicians, who enter data into BadgerNet on admission of the baby, (magnesium given and reasons if not given), and thus are able to interrogate the data to present locally and to inform areas of learning and training for their unit.

In the first PReCePT project a detailed case note review was conducted to gain deeper understanding of the baseline and the reasons why magnesium sulphate was not administered or not recorded. Since this time the fields in BadgerNet have become compulsory therefore it is not necessary to perform a notes review to gain a baseline, (retrospective data collection is usually time consuming and usually incomplete). It is recommended that a process for notes review may be useful to understand incidents where magnesium sulphate is not administered or where data is missing; this may be undertaken by the Midwife Lead or the Obstetrician Lead in each unit.

4.2 Using BadgerNet Data to Support Quality Improvement

The NHS Patient Safety Measurement Unit, (PSMU) will create a national dashboard demonstrating the data from BadgerNet with regard to magnesium sulphate administration. AHSNs will be able to select themselves and see the units within their region and any variation between units/regions. This will be accessible from the PSMU website. Please contact the AHSN PReCePT QI Lead for further information.

The PSMU operates on a presumption of transparency, although will caveat the data for management purposes only, and the dashboard will be positioned behind a log-in process (it is not public, but is available to everyone with access so everyone can see everyone else's data).

Key points to note are:

1. The BadgerNet data is available to the PSMU within 4 weeks of quarter end
2. The PSMU will update this cumulatively; so any late data for example from quarter 4 will be available in quarter 1 and will be retrospectively added to give the most up to data picture.
3. PSMU require a list of those who require access. All AHSNs have access to the PSMU website thus it is a logical place to host the data. PSMU can add personnel as required.

4.3 Continuous Quality Improvement – Compliance with PReCePT Clinical Guidelines

The learning from the first PReCePT project highlighted three groups of mothers who did not receive magnesium sulphate:

1. Mothers with a complex clinical presentation
2. Mothers who presented as an emergency where there was not always sufficient time to administer the full dose (both loading and maintenance infusion doses)
3. In utero transfers to appropriate level unit for gestation of baby, with expedited delivery required on admission.

The evidence demonstrates that administration of the initial loading dose, without the subsequent maintenance infusion still confers benefit and should be administered even if it is not feasible to continue with the ongoing infusion. In the first PReCePT project an effective approach that developed was giving the magnesium sulphate loading dose before ambulance transfer, as running maintenance infusions during transfer is complicated. It is worth maternity units considering how they can plan for such occasions and embed a strategy into their clinical practice (Crowther et al 2017).

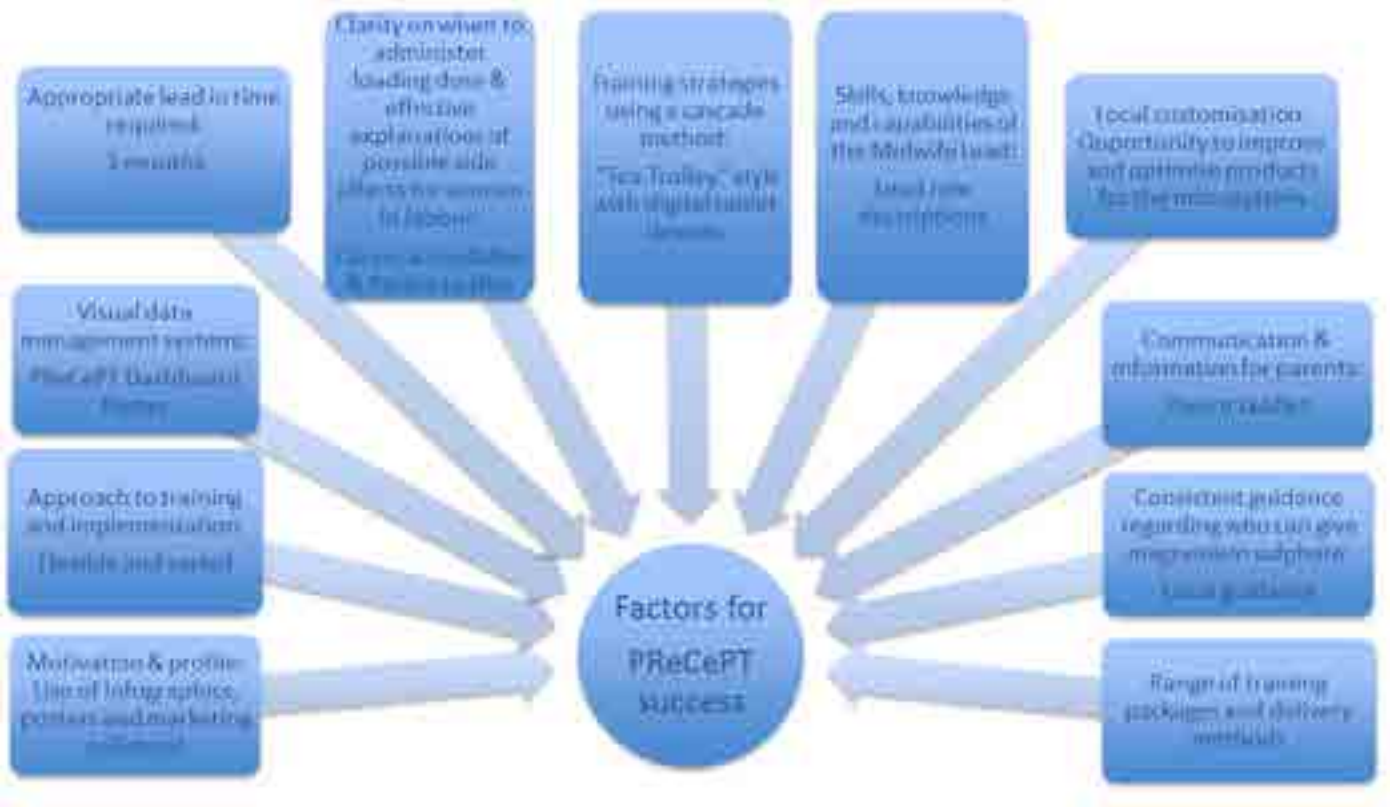
It may also increase understanding and knowledge if cases where magnesium sulphate was declined by the mother/parents can be explored further. This may then assist in developing parent information and supporting discussions allaying any fears and concerns that exist.

The discussion from such reviews could be the focus of a discussion group in Life QI which facilitates system wide learning and improvement.

4.4 Known Challenges and Factors for Success

Figure 1 overleaf highlights the key challenges experienced during the first PReCePT project and how they were overcome .

Part 4: Behaviour Change



4.5 Embedding knowledge into practice

The journey from gaining new knowledge to the goal of consistently sustaining a new intervention in clinical practice takes time, effort, motivation and engagement. The first PReCePT project used an established model for improvement, the Institute for Healthcare Improvement Model for Improvement, which is also used being by the MNHSC. Thus, the same approach is recommended for this programme.

The quality improvement support offer from each AHSN includes local coaching of Midwife Leads at a regional level. Each AHSN is able to design a coaching strategy that best fits their region, taking into account the number of units, frequency of meetings, face to face or virtual, and whether group coaching approach or a Community of Practice for peer to peer support would be beneficial.

Regional Neonatal Leads will be offered one-one coaching from the National Clinical Lead. This includes the opportunity for monthly telephone coaching to help with trouble shooting, advice around achieving buy-in, setting up, understanding the data, reporting, sustaining momentum and improvement. Exploration of other support models including buddy models with Neonatal ODNs and creating a community using small group webinars may also be useful.

4.6 Reporting Measures and Process

The Patient Safety Measurement Unit will provide a quarterly data feed from BadgerNet to all AHSNs which will be accessed from the PSMU website via a log in process. This will be accessed by PReCePT Leads in each AHSN or via a local arrangement. BadgerNet is the clinical audit database completed by neonatal clinicians in every neonatal unit and provides the clinical data used by the National Neonatal Audit Programme. Fields relating to the magnesium sulphate care pathway are mandatory. Each AHSN will report to NHS England.

4.7 Sustainability

This implementation guide and the PReCePT QI Toolkit will serve to support the drive to reduce the incidence of cerebral palsy in England. This key measure of success will not be evident immediately and thus progress will be measured using the quantitative measures within BadgerNet and the qualitative evidence from maternity units - the knowledge, expertise and clinical practice of the staff who care for the mothers during the maternal pathway of care.

Each maternity unit will need to determine when they believe the magnesium sulphate pathway is embedded. As with any intervention, sustainable monitoring and review will be required to ensure the process of quality improvement continues beyond the life of this programme. This may be at local maternity and neonatal unit level, for example, though completion of NICE Quality Standards Framework, or at a regional/national level with the Neonatal Operational Delivery Network and NHSE/NHSi.

4.8 Evaluation of the PReCePT Programme

This two-year programme will be evaluated using both quantitative and qualitative methodologies. The full evaluation design is in development at the time of the publication of this Implementation Guide. This includes a research project, The PReCePT Study, which aims to evaluate the impact of different quality improvement methods on the uptake of magnesium sulphate administration.

Part 4: Behaviour Change

Details of the measures will be published once agreed. They are likely to include the following for example quantitative measures such as:

- Magnesium sulphate administration uptake rates
- Number and proportion of staff trained.

And qualitative measures such as:

- Training methods and resources
- Increase in knowledge of role of magnesium sulphate in preventing Cerebral Palsy
- Impact of the QI Toolkit and this implementation guide
- Sustainability of any progress over the 2 year period.

A key aspect of enquiry may also explore the impact of using AHSNs to implement large-scale change across England and whether spread and adoption of quality improvement interventions in this way has been successful.

Appendix 1

	Get Ready for PReCePT Checklist	Yes	No
1	Appoint AHSN PReCePT Quality Improvement Lead & Regional Neonatal Lead		
2	Knowledge & understanding of baseline BadgerNet data for each maternity and neonatal unit with regard to magnesium sulphate administration		
3	Awareness of the care level of maternity units e.g. (NICU, SCBU), and the number of preterm mothers usually seen in each unit		
4	Understand the use and application of NICE NG25 with regard to Magnesium Sulphate administration (via NICE Quality Standards audit if available)		
5	Gain knowledge of National Neonatal Audit Programme Report 2016 results		
6	Identify key local stakeholders for the project: · Neonatal ODN Lead · Maternity Clinical Network Lead · MNHSC Lead in AHSN and units · Executive sponsor of MNHSC in each maternity & neonatal unit · Executive Sponsor for PReCePT Programme · Parent/Public involvement (including use of patient stories & leadership)		
7	Develop project delivery plan at AHSN level with start & project finish dates for each unit		
8	Clarify access to BadgerNet data via Patient Safety Measurement Unit or by local arrangement		
9	Review and consider known challenges & factors for success		
10	Identify key roles at unit level: Midwife Lead, Obstetrician Lead, Executive Sponsor		
11	Develop project implementation plan at maternity and neonatal unit level for each unit		
12	Agree timeline for achieving 85% administration rate of magnesium sulphate or 95% if 85% already achieved for each maternity and neonatal unit		
13	Develop AHSN Communications Plan		
14	Maternity Unit Communications plan		
15	Awareness of Maternal & Neonatal Health Safety Collaborative wave and progress of each unit and collaborate with relevant personnel to ensure timing of PReCePT Programme is beneficial to all stakeholders		

Appendix 1

	Get Ready for PReCePT Checklist	Yes	No
16	Understand Regional Neonatal Lead coaching offer with PReCePT National Neonatal Lead		
17	Use of BadgerNet in each unit: who completes it, verifies it, "owns it", disseminates it,		
18	Review local practice and whether a magnesium care pathway is in place		
19	Develop AHSN plan for coaching/support for Midwife Lead roles in each unit		
20	Consider if Parent Leaflet will be personalised at Trust level. If so, understand process and the timeline		
21	Use of Proforma in each maternity unit or other identifiable audit trail in case notes (consider digital options if electronic record in use)		
22	Review local maternity and neonatal clinical guidelines for inclusion of administration of magnesium sulphate as per PReCePT and/or NICE guidance (NG25)		
23	Identify and agree process for monthly review of missed doses and how learning is shared to clinicians and project team members at unit and AHSN level		
24	Design a training plan for each maternity unit		
25	Gain agreement on using Aide Memoirs (Posters, pens, lanyards, magnets, laminated guideline). If so, who is ordering and funding?		
26	Agree how PReCePT Quality Improvement Toolkit & Implementation Guide will be accessed and available in maternity & neonatal units plus clinical areas		
27	Ensure awareness of reporting requirements locally and nationally		
28	Consider & be mindful of the need for sustainability post PReCePT Programme		

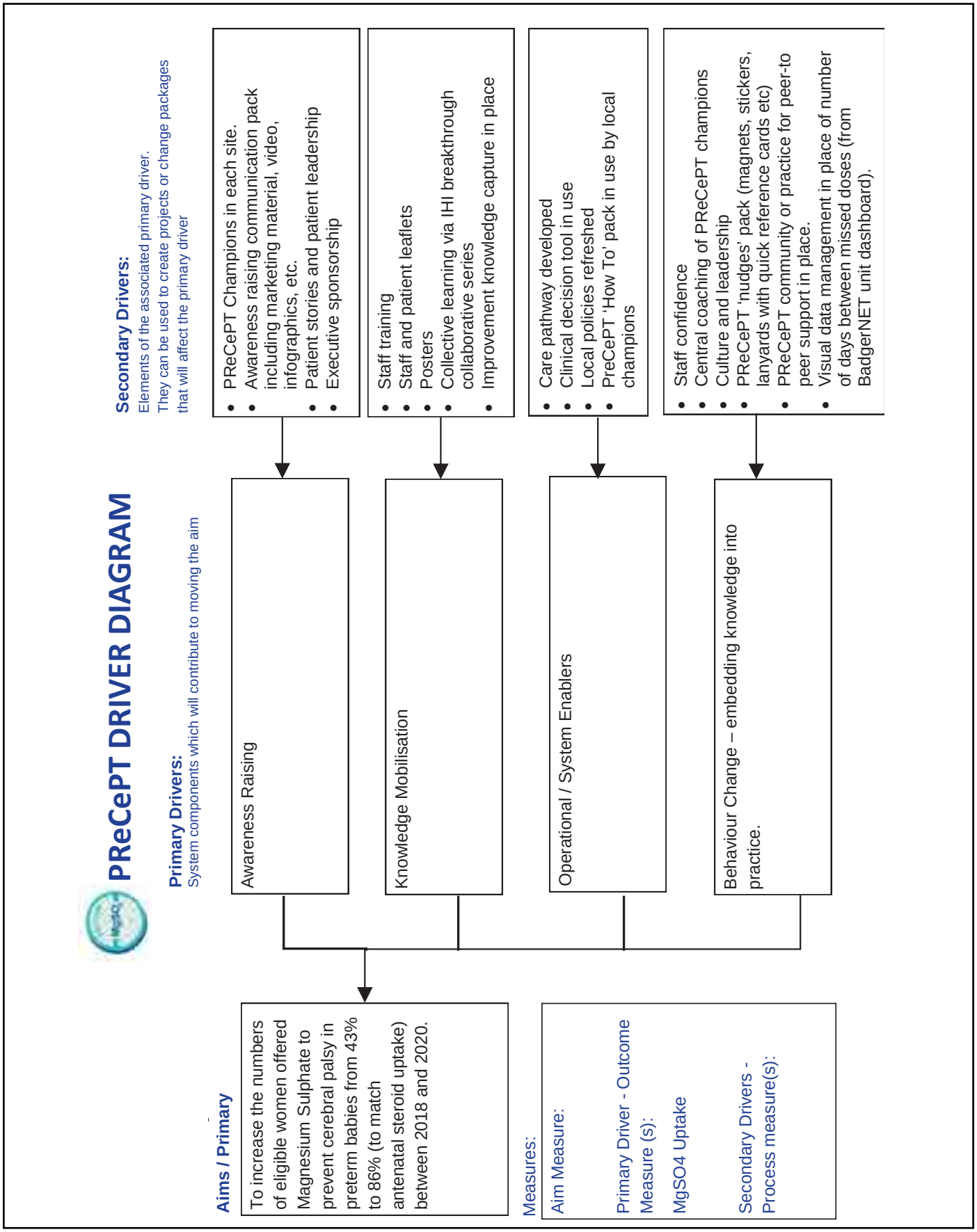
Appendix 2

	Are you ready for PReCePT?	Yes	No
1	AHSN PReCePT Quality Improvement Lead in post		
2	Clear understanding of the local/regional performance in relation to administration of magnesium sulphate and the scale/scope of the challenge ahead		
3	Knowledge of the levels of care provided by each maternity and neonatal unit and how this may influence implementation and embedding of the magnesium sulphate care pathway		
4	Knowledge of performance against NICE Quality Standard for NG25 and how this may influence delivery plan at a unit/regional level		
5	Knowledge and understanding of National Neonatal Audit Programme Report 2016 results for each maternity and neonatal unit as well as regional level data		
6	Active engagement with key local stakeholders is in place and ongoing		
7	Project delivery plan at AHSN level completed		
8	Access to BadgerNet data confirmed and process understood		
9	Known challenges & factors for success included in delivery plan		
10	Key roles at unit level in place (Midwife Lead, Obstetrician Lead, Executive Sponsor)		
11	Project implementation plan at maternity and neonatal unit level for each unit in place		
12	Timeline for achieving 85% or 95% administration rate of magnesium sulphate agreed fro each unit		
13	AHSN Communications Plan in place		
14	Maternity Unit Communications plan in place		
15	Active collaboration with Maternal & Neonatal Health Safety Collaborative underway		
16	Regional Neonatal Lead coaching plan with PReCePT National Neonatal Lead confirmed		
17	Use of BadgerNet in each unit confirmed and process disseminated at AHSN & unit level		
18	Magnesium care pathway in place		
19	AHSN plan for coaching/support for Midwife Lead roles agreed and in progress		
20	Parent Leaflet available in each maternity and neonatal unit		
21	Process of documentation of magnesium sulphate administration in clinical notes agreed and shared locally		

Appendix 2

	Are you ready for PReCePT?	Yes	No
22	Local maternity and neonatal clinical guidelines include administration of magnesium sulphate as per PReCePT and/or NICE guidance (NG25)		
23	Process for monthly review of missed doses and how learning is shared to clinicians and project team members at unit and AHSN level agreed and disseminated		
24	Training delivered as per plan or in progress		
25	Use of Aide Memoirs agreed and materials ordered and available		
26	PReCePT Quality Improvement Toolkit & Implementation Guide accessible and available in maternity & neonatal units		
27	Reporting requirements agreed locally and nationally and process in place		
28	Future sustainability post PReCePT Programme considered		

Appendix 3
PReCePT Driver Diagram



Appendix 4
PReCePT Ask 5 Tally

Ask five people in a team/area the following questions and use a five bar tally (e.g. 𝍸 II). Repeat on a monthly basis throughout the project to assess awareness in the wider team. Add in any other questions as appropriate for your measurement plan.

Date:			
Team:			
Total responses:		**Yes**	**No**
Have you heard about the PReCePT Programme?			
Can you tell me what PReCePT stands for? **PRevention of Cerebral Palsy in PreTerm Labour** (Mark Yes if all 5 correct)			
Have you heard of the benefits of magnesium sulphate when used in preterm labour?			
Are you aware of where to find the PReCePT Toolkit & Implementation Guide?			
Are you familiar with the Parent Information Leaflet?			
Do you know where to find BadgerNet data for your unit?			
Have you seen the PReCePT posters, magnets & lanyards in your unit?			
Thank you for your time			

References

1. Burhouse A, et al. Preventing cerebral palsy in preterm labour: a multi-organisational quality improvement approach to the adoption and spread of magnesium sulphate for neuroprotection. BMJ Open Quality. July 2017- Volume 6, issue 2

2. Doyle LW, Crowther CA, Middleton P, Marret S, Rouse D. Magnesium sulphate for women at risk of preterm birth for neuroprotection of the fetus. Cochrane Database of Systematic Reviews 2009, Issue 1. Art. No.: CD004661. DOI: 10.1002/14651858.CD004661.pub3. Available at http://summaries. cochrane.org/CD004661/magnesium-sulphate-for-women-at-risk-of¬preterm-birth-for-neuroprotection-of-the-fetus

3. Crowther CA, Middleton PF, Voysey M, Askie L, Duley L, Pryde PG, Marret S, Doyle LW; AMICABLE Group. Assessing the neuroprotective benefits for babies of antenatal magnesium sulphate: An individual participant data meta-analysis. PLoS Med. 2017 Oct 4;14(10):e1002398. doi: 10.1371/journal. pmed.1002398.
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