



## Complete Summary

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### GUIDELINE TITLE

Induction of labour.

### BIBLIOGRAPHIC SOURCE(S)

Royal College of Obstetricians and Gynaecologists. Induction of labour. London: RCOG Press; 2001 Jun. 78 p. (Evidence-based clinical guidelines; no. 9). [158 references]

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

Labour

### GUIDELINE CATEGORY

Management

### CLINICAL SPECIALTY

Family Practice  
Internal Medicine  
Obstetrics and Gynecology

### INTENDED USERS

Advanced Practice Nurses  
Nurses  
Patients

Physician Assistants  
Physicians

#### GUIDELINE OBJECTIVE(S)

- To evaluate the role of induction of labour with a live fetus within a variety of clinical situations
- To evaluate and compare the various methods of induction of labour of women in relation to maternal and fetal outcome measures
- To consider the resource implications for the use of induction of labour

#### TARGET POPULATION

Pregnant women

#### INTERVENTIONS AND PRACTICES CONSIDERED

1. Providing women with information regarding choices for induction of labour, including potential risks and benefits, and obtaining informed consent
2. Induction of labour with oxytocin (with or without amniotomy); prostaglandin agents (intracervical, intravaginal, and oral prostaglandin E<sub>2</sub> or misoprostol preparations); or membrane sweeping. (Note: other interventions including castor oil, breast stimulation, sexual intercourse, and acupuncture are considered but not recommended.)
3. Continuous electronic monitoring of both fetal heart rate and uterine activity during labor induction
4. Management of uterine hypercontractility, including use of terbutaline (Note: maternal facial oxygen is considered but not recommended)
5. Use of routine early-pregnancy ultrasound to confirm gestation
6. Offering induction of labour to all women after 41 weeks gestation and to other high-risk populations, including women with diabetes or those with prelabour rupture of membranes
7. Screening high risk pregnancies from 42 weeks using complex antenatal fetal monitoring (computerised cardiotocography, amniotic fluid index, and assessment of fetal breathing, tone, and gross body movements) or simple antenatal fetal monitoring (standard cardiotocography and ultrasound measurement of maximum pool depth)

#### MAJOR OUTCOMES CONSIDERED

Maternal outcomes include:

- Time to vaginal delivery or vaginal delivery rates within a specified time
- Operative delivery rates (caesarean section and instrumental vaginal delivery)
- Length of labour/incidence of prolonged labour
- Measures of effectiveness (oxytocin augmentation rates, epidural usage, cervix unfavourable/unchanged at 12–24 hours)
- Serious maternal morbidity or death
- Other adverse outcomes (e.g. uterine hypercontractility, postpartum haemorrhage, maternal adverse effects)
- Measures of maternal satisfaction

Fetal outcomes include:

- Serious neonatal morbidity or perinatal death
- Other adverse perinatal outcomes (meconium-stained liquor, five-minute Apgar score of less than seven, neonatal intensive care unit admission)

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)  
Hand-searches of Published Literature (Secondary Sources)  
Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

#### Search Strategy

The aim of the literature review was to identify and synthesise relevant evidence within the published literature, in order to answer specific clinical questions. Thus, clinical practice recommendations are based on evidence where possible and gaps in the evidence for which future research is needed are identified. Searches were carried out for each topic of interest.

- The Cochrane Library, up to Issue 3 of 2000, was searched to identify systematic reviews (with or without meta-analyses) of randomized controlled clinical trials and randomised controlled trials.
- The Cochrane Pregnancy and Childbirth Group (CPCG) specialist register of completed and continuing controlled trials was searched by the Cochrane Pregnancy and Childbirth Group Trials Search Co-ordinator.
- The electronic database, MEDLINE (CD Ovid version), was searched for the period January 1966 to November 2000, including foreign-language publications.
- The electronic database EMBASE was searched between 1988 to November 2000 to identify publications, usually European, not indexed on MEDLINE.
- The Midwives Information and Resource Service (MIDIRS), CINAHL (Cumulative Index to Nursing and Allied Health Literature) and the British Nursing Index were searched to ensure that relevant nursing and midwifery literature were included.
- Guidelines by other development groups were searched for on the National Guidelines Clearinghouse database, as were the TRIP database and OMNI service on the Internet.
- The reference lists in these guidelines were checked against the Guideline Development Group's searches, in order to identify any missing evidence.
- The Database of Abstracts and Reviews of Effectiveness (DARE) was searched.
- Reference lists of non-systematic review articles and studies obtained from the initial search were reviewed and journals in the Royal College of Obstetrics and Gynaecologists library were hand-searched to identify articles not yet indexed.

- There was no systematic attempt to search the 'grey literature' (conferences, abstracts, theses and unpublished trials).
- The economic evaluation included a search of the NHS Economic Evaluation Database (The Cochrane Library, Issue 1, 2001), MEDLINE January 1966 to November 2000 and EMBASE 1988 to November 2000. Relevant experts in the field were contacted for further information.
- Searches were performed using generic and specially developed filters, relevant MeSH (medical subject headings) terms and free text terms.

Details of literature searches are available on application to Clinical Excellence Support Unit, Royal College of Obstetrics and Gynaecologists.

### Sifting and Reviewing the Literature

A preliminary scrutiny of titles and abstracts was undertaken and full papers were obtained if the research addressed the Guideline Development Group's question on the topic. Following a critical review of the full version of the study, articles not relevant to the subject in question were excluded. Studies that did not report on relevant outcomes were also excluded.

For all the subject areas, evidence from the study designs least subject to sources of bias were included. Where possible, the highest levels of evidence were used, but all papers were reviewed using established guides. Published systematic reviews or meta-analyses have been used if available.

For subject areas where neither was available, other appropriate experimental or observational studies were sought.

### NUMBER OF SOURCE DOCUMENTS

Not stated

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

#### Levels of Evidence

I a: Evidence obtained from systematic review of meta-analysis of randomised controlled trials

I b: Evidence obtained from at least one randomised controlled trial

II a: Evidence obtained from at least one well-designed controlled study without randomisation

II b: Evidence obtained from at least one other type of well-designed quasi-experimental study

III: Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies

IV: Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities

## METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

## DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Identified articles were assessed methodologically and the best available evidence was used to form and support the recommendations. The highest level of evidence was selected for each clinical question. Using the evidence-level structure highlighted above, the retrieved evidence was graded accordingly.

The definitions of the types of evidence used in the guideline originate from the U.S. Agency for Health Care Policy and Research (now known as the U.S. Agency for Healthcare Research and Quality). The clinical question dictates the highest level of evidence that should be sought. For issues of therapy or treatment, the highest level of evidence is meta-analyses of randomised controlled trials or randomised controlled trials. This would equate to a Grade A recommendation using the system outlined above.

For issues of prognosis, a cohort study is the best level of evidence available. The best possible level of evidence would equate to a grade B recommendation. Thus, it should not be interpreted as an inferior grade of recommendation, as it represents the highest level of evidence attainable for that type of clinical question.

All retrieved articles have been appraised methodologically using established guides. Where appropriate, if a systematic review, meta-analysis or randomised controlled trial existed in relation to a topic, studies of a weaker design were ignored.

The evidence was synthesised using qualitative methods. These involved summarising the content of identified papers in the form of evidence tables and agreeing brief statements that accurately reflect the relevant evidence.

Following a preliminary review of the available evidence, it became apparent that there were in excess of 700 randomised controlled trials concerning induction of labour, which would need to be examined in the development of the guideline. A collaboration between the Cochrane Pregnancy and Childbirth Group and the Clinical Effectiveness Support Unit of the Royal College of Obstetricians and Gynaecologists was formed in order to develop an integrated series of systematic reviews examining the various methods available for induction of labour. The methods used in the development of these systematic reviews are outlined in Appendix 1 of the original guideline document. These reviews included unpublished data in accordance with standard Cochrane methodology.

When making judgments about resource use implications, the Group tried as far as possible to rely on published economic evidence. On one occasion, however, the Guideline Development Group requested a simple costing exercise: the comparison of vaginal tablets versus vaginal gel for induction of labour. In this case, good evidence was available about clinical effectiveness and there were no major cost uncertainties that would preclude drawing conclusions from a simple costing exercise.

## METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Nominal Group Technique)

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The Guideline Development Group was presented with the available research evidence in order to answer its questions. From this, recommendations for clinical practice were derived using consensus methods. Where there were areas without available research evidence, consensus was again used.

Recommendations were based on, and explicitly linked to, the evidence that supports them. Consensus was reached using the nominal group technique. This consensus method involves the grading of draft recommendations by the members of the Guideline Development Group prior to the meeting. These recommendations and the gradings given to them were then considered during the meeting and a group opinion was reached. The recommendations were then graded according to the level of evidence upon which they were based.

It is accepted that, in this grading system, the evidence itself is not graded according to individual methodological quality of the studies, although it is discussed in the text supporting each recommendation. Limited results or data are presented in the text and these data are available in full in the relevant evidence tables.

Grade C recommendations and good practice points are not based on directly applicable research evidence. However, the views of the Guideline Development Group, combined with comments from the extensive peer review suggest that the recommendations with these gradings are acceptable to a wide body of expert opinion.

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The recommendations were graded according to the level of evidence upon which they were based. The grading scheme used was based on a scheme formulated by the Clinical Outcomes Group of the National Health Service (NHS) Executive.

Grade A - Requires at least one randomised controlled trial as part of a body of literature of overall good quality and consistency addressing the specific recommendation (evidence levels Ia, Ib)

Grade B - Requires the availability of well-conducted clinical studies but no randomised clinical trials on the topic of the recommendation (evidence levels IIa, IIb, III)

Grade C - Requires evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities. Indicates an absence of directly applicable clinical studies of good quality (evidence level IV)

## COST ANALYSIS

### Induction of Labour

Two published economic studies have examined the costs of induction of labour versus expectant management of prolonged pregnancy, in different settings. The first study, based on a Canadian multicentre trial, found that expectant management was more costly than induction with prostaglandin gel, due mainly to costs of additional monitoring and a higher caesarean-section rate. The second study, based on the TERMPROM international multicentre trial, found that there was no difference in cost between expectant management and induction with prostaglandin. The difference is largely due to assumptions made about the operative delivery rate differential: the TERMPROM trial found only small and statistically insignificant operative delivery rate differences between the treatment arms.

An important issue not dealt with by these published studies is that, in the context of local staff shortages, increased numbers of women being induced for prolonged pregnancy may have local opportunity costs in terms of delivery suite workload. Other women and babies may be exposed to risk if the induction of labour workload is increased. This is a matter for local discussion and debate, since it depends crucially on local staffing circumstances.

### Methods of Induction

#### Oxytocin and Prostaglandin

One main study examined the costs of oxytocin compared with prostaglandin as first-line method of labour induction. Based on earlier Cochrane review data, this study found that prostaglandin was cost neutral or cost saving compared with oxytocin, once non-medicine costs were taken into account. Although the medicines cost was higher with use of prostaglandin, this cost was offset by savings associated with a reduced rate of caesarean section, a reduced rate of postpartum haemorrhage requiring blood transfusion and reduced monitoring costs.

A more recent study found that oxytocin may not be more costly than prostaglandin. However, this conclusion may not be generally applicable, as it was based on the findings of the TERMPROM multicentre trial, which found no significant differences in operative delivery rates between the two methods of induction.

A comparison of different preparations of vaginal prostaglandin (PGE<sub>2</sub>)

One study examined the economic considerations of comparing a regimen of one versus two doses of prostaglandin gel for induction of labour. It found that, once a full range of costs was taken into account, the two-dose regimen was slightly cheaper. This was largely due to savings associated with a slightly lower rate of assisted deliveries in the two-dose group. However, there is a degree of uncertainty surrounding this estimate, because, in this study, any necessary augmentation with amniotomy and oxytocin infusion was delayed in the one-dose group until 14–20 hours after initial application of prostaglandin. Further research is therefore needed, to examine outcomes when augmentation in the one-dose regimen is commenced at an earlier stage.

No published study has examined cost effectiveness of slow-release pessary versus gel or tablets. An unpublished economic study submitted by a slow-release pessary manufacturer comparing their product with gel was considered not to provide convincing evidence of cost effectiveness. The drug cost of the slow-release pessary is considerably higher: about £15 per induction more costly than gel and £40 per induction more costly than tablets. However, there was no statistically significant difference in any of the main clinical outcomes, apart from a slightly reduced need for oxytocin augmentation – by about 20% in absolute terms. This may be an overestimate of any differential in routine practice since, in the trial, only one dose of gel was used in many cases rather than the normal practice of using two or more doses and a 10-milligram pessary was used (only the 5-milligram pessary is available in the United Kingdom [UK]). Even if this estimate is accepted, however, the cost savings from reduced oxytocin augmentation only partially offset the higher drug cost. The cost per oxytocin augmentation is approximately £12 to £21 (see calculations in original guideline document) and 20% of this yields an offset of £2.50 to £4.50 per induction.

No published study has examined costs of vaginal tablets versus vaginal gel. It was therefore considered appropriate to conduct a simple costing exercise to examine this, which is summarised in the original guideline document. The basic conclusion of this simple costing exercise is that vaginal tablets are more cost effective than vaginal gel. This costing exercise assumes, in line with the clinical evidence presented above, that both preparations are equally effective in terms of all neonatal outcomes, apart from a slightly greater need for oxytocin augmentation in the case of vaginal tablets. There are no major cost uncertainties that could alter this conclusion – in particular, the existing trial evidence shows that it is highly unlikely that there is a substantial difference in the caesarean-section rate between the two preparations.

#### Vaginal or Oral Misoprostol (PGE<sub>1</sub>)

Misoprostol is considerably cheaper than both intravaginal and intracervical PGE<sub>2</sub>. With reference to the recommended regimen of vaginal PGE<sub>2</sub> tablet in the original guideline document, the relative costs compared with vaginal misoprostol would be £0.18 for one 200-microgram tablet of misoprostol compared with £8.13 for a 3-milligram PGE<sub>2</sub> tablet. In addition, there would be further indirect cost savings to the National Health Service (NHS), given the reduced rate of operative delivery.

Further data are needed about the theoretical risks of misoprostol. Therefore, until these are available there will remain considerable uncertainty about its overall cost effectiveness.

## METHOD OF GUIDELINE VALIDATION

External Peer Review  
Internal Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Successive drafts of the guideline were written and discussed by the Guideline Development Group. At the fourth draft stage, a formal peer review process was undertaken.

Reviewers included representatives from stakeholder organizations registered with National Institute for Clinical Excellence (NICE) and individuals or organisations from the area of practice represented in the Guideline Development Group. The draft guideline was submitted to these individuals or organisations with a request for appraisal and comment.

The comments made by the peer reviewers were collated and presented anonymously for consideration by the Guideline Development Group. All peer review comments were considered systematically by the Group and the resulting actions and responses were recorded. Seventy percent of the comments resulted in amendments to the guideline. Further information is available on request.

The guideline was also reviewed by the Guidelines Advisory Committee and Executive of National Institute for Clinical Excellence.

The guideline was sent to a further group of reviewers who particularly concentrated on the methodology used in its development under the independent guideline appraisal system approved by the National Health Service Executive.

The guideline was made available for public comment on the National Institute for Clinical Excellence Web site for a period of four weeks.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

In addition to these evidence-based recommendations, the guideline development group also identifies points of best clinical practice in the original guideline document.

Levels of evidence (Ia-IV) and grading of recommendations (A–C) are defined at the end of the Major Recommendations field.

Care During Induction of Labour

Woman-centred care

C - Women must be able to make informed choices regarding their care or treatment via access to evidence based information. These choices should be recognised as an integral part of the decision-making process.

#### Place of induction

C - For women who are healthy and have had an otherwise uncomplicated pregnancy, induction of labour with vaginal prostaglandin E<sub>2</sub> agents can be conducted on antenatal wards, prior to the active phase of labour.

C - When undertaking induction of labour in women with recognised risk factors (including suspected fetal growth compromise, previous caesarean section and high parity), the induction process should not occur on an antenatal ward.

#### Fetal surveillance and induction of labour

C - Wherever induction of labour occurs, facilities should be available for continuous uterine and fetal heart rate (FHR) monitoring.

C - Fetal well-being should be established immediately prior to induction of labour.

C - Following induction of labour with vaginal prostaglandins (PGE<sub>2</sub>), fetal well-being should be established once contractions are detected or reported.

C - For women who are healthy and have had an otherwise uncomplicated pregnancy, the assessment of fetal well-being following the administration of vaginal prostaglandins should comprise an initial assessment with continuous electronic fetal monitoring and, once normality is confirmed, intermittent monitoring can be used.

C - Where oxytocin is being used for induction or augmentation of labour, continuous electronic fetal monitoring should be used.

#### Uterine hypercontractility with induction agents

C - Prolonged use of maternal facial oxygen therapy may be harmful to the fetus and should be avoided. There is no research evidence evaluating the benefits or risks associated with the short-term use of maternal facial oxygen therapy in cases of suspected fetal compromise.

B - In cases of uterine hypercontractility with a suspicious or pathological cardiotocograph (CTG) secondary to oxytocin infusions, the oxytocin infusion should be decreased or discontinued.

A - In the presence of abnormal fetal heart rate patterns and uterine hypercontractility (not secondary to oxytocin infusion), tocolysis should be considered. A suggested regimen is subcutaneous terbutaline 0.25 milligrams.

B - In cases of suspected or confirmed acute fetal compromise, delivery should be accomplished as soon as possible, taking account of the severity of the fetal heart rate abnormality and relevant maternal factors. The accepted standard has been that, ideally, this should be accomplished within 30 minutes.

#### Care of higher-risk pregnancies

C - When undertaking induction of labour in women with recognised risk factors (including suspected fetal growth compromise, previous caesarean section and high parity), the clinical discussion regarding the timing and method of induction of labour should be undertaken at consultant level. The induction process should not occur on an antenatal ward.

#### Indications for Induction of Labour

##### Prolonged pregnancy

A - An ultrasound to confirm gestation should be offered before 20 weeks of gestation, as this reduces the need for induction for perceived postterm pregnancy.

A - Women with uncomplicated pregnancies should be offered induction of labour beyond 41 weeks.

A - From 42 weeks, women who decline induction of labour should be offered increased antenatal monitoring consisting of a twice weekly cardiotocograph and ultrasound estimation of maximum amniotic pool depth.

##### Diabetes in pregnancy

C - Women who have pregnancies complicated by diabetes should be offered induction of labour prior to their estimated date for delivery.

#### Induction of labour in the presence of prelabour rupture of the membranes

A - Women with prelabour rupture of the membranes at term (over 37 weeks) should be offered a choice of immediate induction of labour or expectant management.

A - Expectant management of women with prelabour rupture of the membranes at term should not exceed 96 hours following membrane rupture.

#### Method of Induction of Labour in Specific Clinical Situations

##### Membrane sweeping

A - Prior to formal induction of labour, women should be offered sweeping of the membranes.

A - When membrane sweeping is proposed, discussions should include information that informs women that membrane sweeping:

- Is not associated with an increase in maternal or neonatal infection
- Is associated with increased levels of discomfort during the examination and bleeding

Oxytocin compared with prostaglandins for induction of labour

A - Prostaglandins should be used in preference to oxytocin when induction of labour is undertaken in either nulliparous or multiparous women with intact membranes, regardless of their cervical favourability.

A - Either prostaglandins or oxytocin may be used when induction of labour is undertaken in nulliparous or multiparous women who have ruptured membranes, regardless of cervical status, as they are equally effective.

Comparison of intracervical and intravaginal prostaglandins (PGE<sub>2</sub>)

A - When induction of labour is undertaken with prostaglandins, intravaginal prostaglandin E<sub>2</sub> should be used in preference to intracervical preparations, as they are equally effective and administration of vaginal prostaglandin E<sub>2</sub> is less invasive.

Comparison of different preparations of vaginal prostaglandin (PGE<sub>2</sub>)

A - Given that they are clinically equivalent, when induction of labour is undertaken with vaginal prostaglandin E<sub>2</sub> preparations, vaginal tablets should be considered in preference to gel formulations.

C - Recommended regimens for vaginal prostaglandin E<sub>2</sub> preparations include:

- Prostaglandin E<sub>2</sub> tablets: 3 milligrams prostaglandin E<sub>2</sub> 6 to 8 hourly. The maximum total dose is 6 milligrams for all women.
- Prostaglandin E<sub>2</sub> gels: 2 milligrams prostaglandin E<sub>2</sub> in nulliparous women with an unfavourable cervix (Bishop's score less than 4), 1 milligram for all other women. In either, a second dose of 1 to 2 milligrams can be administered six hours later.

The maximum dose is 4 milligrams prostaglandin E<sub>2</sub> for nulliparous women with an unfavourable cervix and 3 milligrams for all other women.

Comparison of different regimens of oxytocin administration

C - Oxytocin should not be started for six hours following administration of vaginal prostaglandins.

C - In women with intact membranes, amniotomy should be performed where feasible prior to commencement of an infusion of oxytocin.

C - When induction of labour is undertaken with oxytocin the recommended regimen is:

- A starting dose of 1 to 2 milliunits per minute
- Increased at intervals of 30 minutes or more

The minimum dose possible of oxytocin should be used and this should be titrated against uterine contractions aiming for a maximum of three to four contractions every ten minutes.

Adequate contractions may be established at 12 milliunits per minute.

In the summary of product characteristics the licensed maximum dose is 20 milliunits per minute.

If higher doses are used the maximum dose used should not exceed 32 milliunits per minute.

C - Local protocols for delivery of oxytocin for induction of labour should:

- Specify and use the dose of oxytocin being delivered (milliunits per minute) in preference to the volume of fluid being infused (millilitres per minute)
- Be delivered through an infusion pump or via a syringe driver with a non-return valve.

C - To reduce error, a standard dilution should always be used. Suggested standardised dilutions and dose regimens include:

- 30 iu in 500 ml of normal saline; hence 1ml/hr = 1 milliunits per minute
- 10 iu in 500 ml of normal saline; hence 3ml/hr = 1 milliunits per minute.

C - Oxytocin infusion

Time after starting (minutes)	Oxytocin dose (milliunits per minute)	Volume Infused ( ml/hour)	
		Dilution 30 iu in 500 ml	Dilution 10 iu in 500 ml
0	1	1	3
30	2	2	6
60	4	4	12
90	8	8	24

120	12	12	36
150	16	16	48
180	20	20	60
210	24	24	72
240	28	28	84
270	32	32	96

Doses in bold italics are quantities above those referred to in the summary of product characteristics of 20 milliunits per minute.

Definitions:

Grading of Recommendations:

Grade A – Requires at least one randomised controlled trial as part of a body of literature of overall good quality and consistency addressing the specific recommendation (evidence levels Ia, Ib)

Grade B – Requires the availability of well-conducted clinical studies but no randomised clinical trials on the topic of the recommendation (evidence levels IIa, IIb, III)

Grade C – Requires evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities. Indicates an absence of directly applicable clinical studies of good quality (evidence level IV)

Levels of Evidence:

I a: Evidence obtained from systematic review of meta-analysis of randomised controlled trials

I b: Evidence obtained from at least one randomised controlled trial

II a: Evidence obtained from at least one well-designed controlled study without randomisation

II b: Evidence obtained from at least one other type of well-designed quasi-experimental study

III: Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies

IV: Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities

#### CLINICAL ALGORITHM(S)

An algorithm is provided for the method of induction of labour.

### EVIDENCE SUPPORTING THE RECOMMENDATIONS

#### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

### BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

#### POTENTIAL BENEFITS

- Reduced caesarean section rates
  - Continuous care of the mother in labour has been shown to reduce caesarean rates and the use of analgesia
  - It has been postulated that induction of labour for suspected fetal macrosomia will avoid caesarean section of difficult instrumental vaginal delivery
- Reduced perinatal mortality and morbidity
- Reduced incidence of chorioamnionitis
  - An active policy of induction of labour with oxytocin reduced the incidence of chorioamnionitis
- Reduced risk of neonatal infection
  - Neonatal infection risks were reduced if induction was undertaken with oxytocin
- Reduction of other methods to induce labour
  - Membrane sweeping reduced the frequency of using other methods to induce labour
- Reduction in length of time between intervention and labour with membrane sweeping
- Overall, induction of labour using prostaglandins seem to improve the rate of successful vaginal delivery, lower the rate of caesarean section, lower epidural usage and to be associated with improved maternal satisfaction. The benefits of prostaglandin are less marked in women with ruptured membranes in comparison with women with intact membranes.
- Vaginal misoprostol appears to be a more effective induction agent than either intravaginal or intracervical prostaglandin E<sub>2</sub> or oxytocin. Misoprostol is significantly cheaper than currently recommended prostaglandin E<sub>2</sub> preparations.

Subgroups Most Likely to Benefit:

Women in high-risk pregnancies, particularly diabetic women

## POTENTIAL HARMS

- Hypercontractility
  - In the current series of systematic reviews of vaginal or intracervical prostaglandin E<sub>2</sub> the incidence of hypercontractility ranged from 1-5%
  - The use of misoprostol is associated with an increase in uterine hypercontractility
- Fetal heart rate changes
  - When oxytocin is used there is a risk for fetal heart rate changes
- Respiratory distress in baby
  - There is an increased risk of respiratory distress syndrome in the baby if labour is induced before term
- Pain
  - Median pain scores were higher in women allocated to sweeping of membranes. In addition, more women allocated to sweeping experienced vaginal bleeding and painful contractions not leading to the onset of labour during the 24 hours following the intervention

Subgroups Most Likely to be Harmed:

Induction of labour in women of high parity may be associated with an increased incidence of precipitate labour, uterine rupture and postpartum haemorrhage.

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

The parameters of clinical practice included in this document were arrived at after careful consideration of the available evidence and should be considered as guidelines only. Clinicians involved in intrapartum care must use their professional knowledge and judgment when applying the recommendations to the management of women.

Where research evidence was unavailable, the Guideline Development Groups used other quality appraised guidelines to support their recommendations. The recommendations regarding fetal surveillance during induction of labour are taken from the Royal College of Obstetricians and Gynaecologists guideline titled [The Use of Electronic Fetal Monitoring: the Use and Interpretation of Cardiotocography in Intrapartum Fetal Surveillance](#) (London: RCOG Press; 2001. [Evidence-based clinical guideline; no. 8].

The risks and benefits of induction labour as an intervention for specific clinical conditions arising in pregnancy are not included, e.g., pre-eclampsia.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

A national launch meeting took place on 12 June 2001 to disseminate the findings of the group to interested parties.

It is anticipated that this national guideline will be used as the basis for development of local protocols or guidelines, taking into account local service provision and the needs of the local population. Ideally, local development should take place in a multidisciplinary setting that includes commissioners of health care, general practitioners, specialists and service users.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Staying Healthy

### IOM DOMAIN

Effectiveness  
Patient-centeredness  
Safety

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Royal College of Obstetricians and Gynaecologists. Induction of labour. London: RCOG Press; 2001 Jun. 78 p. (Evidence-based clinical guidelines; no. 9). [158 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2001 Jun

### GUIDELINE DEVELOPER(S)

Royal College of Obstetricians and Gynaecologists - Medical Specialty Society

### GUIDELINE DEVELOPER COMMENT

The guideline was developed by a multiprofessional and lay working group (Guideline Development Group) convened by the Royal College of Obstetricians and Gynaecologists. Members included representatives from:

- Royal College of Obstetricians and Gynaecologists
- Royal College of Midwives
- Royal College of General Practitioners
- British Maternal Fetal Medicine Society

- British Association of Perinatal Medicine
- Faculty of Public Health

#### SOURCE(S) OF FUNDING

Supported by funding awarded by the Department of Health and the National Institute for Clinical Excellence.

#### GUIDELINE COMMITTEE

Guideline Development Group

#### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Committee Members: Professor AA Calder (Chairman); Mrs B Beech Lawrence; Mr R Cookson; Dr P Crowley; Dr P Danielian; Dr A Farebrother; Mr A Foulkes; Mr P Harris; Dr G Lewis; Professor J Neilson; Miss J Rogers; Ms J Thomas; Mr A Kelly; Ms J Kavanagh

#### FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

All members of the Guideline Development Group made formal declarations of interest at the outset, which were recorded. This record is kept on file at the Royal College of Obstetricians and Gynaecologists (RCOG).

#### GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

#### GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [Royal College of Obstetricians and Gynaecologists \(RCOG\) Web site](#).

Print copies: Available from the Royal College of Obstetricians and Gynaecologists' (RCOG) Bookshop, 27 Sussex Place, Regent's Park, London NW1 4RG; Telephone: +44 020 7772 6276; Fax, +44 020 7772 5991; e-mail: [bookshop@rcog.org.uk](mailto:bookshop@rcog.org.uk). A listing and order form are available from the [RCOG Web site](#).

#### AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- NICE short form guideline on induction of labour. London: National Institute for Clinical Excellence (NICE), 2001 Jun. 19 p.

Available from the National Institute for Clinical Excellence Web site:

- [HTML format](#)
- [Portable Document Format \(PDF\)](#)

Print copies: Available from the National Health Service (NHS) Response Line 0870 1555 455, ref: 24010. 11 Strand, London, WC2N 5HR.

## PATIENT RESOURCES

The following is available:

- About induction of labour. Information for pregnant women, their partners and their families. London: National Institute for Clinical Excellence (NICE), 2001 Jun 12. 5 p. Available from the [National Institute for Clinical Excellence Web site](#).
- About induction of labour. Information for pregnant women, their partners and their families (a Welsh version). London: National Institute for Clinical Excellence (NICE), 2001 Jun 12. 5 p. Available from the [National Institute for Clinical Excellence Web site](#).

Print copies: Available from the National Health Service (NHS) Response Line 0870 1555 455, ref: 24011. 11 Strand, London, WC2N 5HR.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

## NGC STATUS

This summary was completed by ECRI on November 26, 2001. The information was verified by the guideline developer as of February 22, 2002.

## COPYRIGHT STATEMENT

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