NICE National Institute for Health and Care Excellence

Caesarean birth (NG192) – Update to recommendations on use of neuraxial diamorphine and post-operative monitoring for women and pregnant people who have had neuraxial diamorphine

This guideline covers when to offer and discuss caesarean birth, procedural aspects of the operation, and care after caesarean birth. It aims to improve the consistency and quality of care for women and pregnant people who are thinking about having a caesarean birth or have had a caesarean birth in the past and are now pregnant again.

These recommendations will update NICE guideline NG192 (published March 2021).

Who is it for?

- Healthcare professionals
- Commissioners
- Pregnant women and pregnant people, their families and carers

What does it include?

- new and revised recommendations on use of neuraxial diamorphine and post-operative monitoring for women and pregnant people who have had neuraxial diamorphine
- rationale and impact information that explains why the committee made the 2023 recommendations and updates, and how they might affect practice and services.

Information about how the guideline was developed is on the guideline's webpage. This includes details of the surveillance review, details of the committee and any declarations of interest.

New and updated recommendations

We have reviewed the evidence on use of neuraxial diamorphine and post-operative monitoring for women and pregnant people who have had neuraxial diamorphine. You are invited to comment on the new and revised recommendations only. These are marked as **[2004, amended 2023]**, **[2021, amended 2023]**, **[2023]**, or no change.

ID Number (please use to identify what comment relates to at consultation)	Existing recommendation in NG192	Proposed revised recommendation	Rationale for change	Impact of change
1	1.6.9 Offer women diamorphine (0.3 to 0.4 mg intrathecally) for analgesia to reduce the need for supplemental analgesia after a caesarean birth. Epidural diamorphine (2.5 to 5 mg) is a suitable alternative where	1.6.9a Offer intrathecal diamorphine (0.3 mg) to reduce the need for supplemental analgesia after a caesarean birth. Use epidural diamorphine (3 mg) as an alternative if intrathecal	The committee agreed that it was not necessary to specify a range of doses for diamorphine because: • 0.3 mg was an adequate dose for intrathecal use and 3mg an adequate dose for epidural use	The dosing of intrathecal and epidural diamorphine will be simpler for staff. No resource impact is anticipated from this change.

	intrathecal diamorphine has not been given. In March 2021, this was an off-label use of diamorphine (both intrathecal and epidural). See NICE's information on prescribing medicines. **[2004, amended 2021]**	diamorphine has not been given. In May 2023, this was an off-label use of diamorphine (both intrathecal and epidural). See NICE's information on prescribing medicines. **[2004, amended 2023]**	• these are the doses suggested by the Obstetric Anaesthetists Association and are the doses used in current clinical practice • the committee were aware of evidence that suggested a ceiling effect in neuraxial opioid doses, above which there is no more analgesic effect but there is an increased risk of side-effects.	
2	No current recommendation	1.6.9b If diamorphine is unavailable, offer: • intrathecal preservative-free morphine (0.1 mg) plus intrathecal fentanyl (0.015 mg), **or** • epidural preservative-free morphine (3 mg), if intrathecal morphine has not been used. Take into account that that neuraxial morphine increases the risk of nausea, vomiting and itching compared to diamorphine, and that these side effects may need treatment. **[2023]**	As there may be intermittent shortages of diamorphine, the recommendations to use morphine as an alternative will provide clear guidance for healthcare professionals to follow in this situation. This will reduce the likelihood of incorrect preparations or dosages of morphine being substituted for diamorphine. The doses of intrathecal or epidural morphine (and fentanyl) are based on those recommended by the Obstetric Anaesthetists Association as being equivalent to the currently used doses of diamorphine.	This change will lead to increased use of preservative-free morphine if there is a shortage of diamorphine. Preservative-free morphine is more expensive than diamorphine so there may be an increased cost to the NHS, but as the frequency and duration of diamorphine shortages is not known it is difficult to predict the resource impact.

			The committee were aware that neuraxial morphine was more likely to lead to side effects than neuraxial diamorphine, and so added advice that these side effects may need treatment to reduce the severity of symptoms.	The treatment of the possible side-effects from morphine are not expected to have a resource impact as these will not affect all women, some women will already receive anti-emetics after a caesarean birth, and the medicines are generics.
3	1.6.4 After caesarean birth under a spinal or epidural anaesthetic, a healthcare professional should carry out continuous one-to-one observation of the woman until she is haemodynamically stable (for example when pulse and blood pressure have returned to baseline values). **[2021]**	1.6.4 After caesarean birth under a spinal or epidural anaesthetic, a healthcare professional should carry out continuous one-to-one observation of the woman or person who has given birth until they are haemodynamically stable (for example when pulse and blood pressure have returned to baseline values). **[2021]**	No changes made	No changes made
4	1.6.5 Provide a woman who has had spinal or epidural diamorphine for caesarean birth, and who is at an increased risk of respiratory depression (for example, a significantly raised BMI, or	1.6.5 For women or people who have given birth who have had intrathecal or epidural diamorphine for caesarean birth, and who have known risk factors for respiratory depression (for	The factors which may increase the risk of respiratory depression have been amended to align with those in the Society for Obstetric Anaesthesia and Perinatology Consensus statement to include	The revised recommendations may increase the number of people assessed as being at risk of respiratory depression, as cardiovascular

	diagnosed obstructive sleep apnoea syndrome), with:
	• continuous pulse oximetry monitoring, and
	• hourly monitoring of
	  ○ respiratory rate
	  ○ heart rate
	  ○ blood pressure
	  ○ temperature
	  ○ pain
	  ○ sedation.
	Monitor the woman for at least 12 hours, continue until they are stable enough to be discharged from anaesthetic care, and then carry out routine observations in accordance with local protocols. **[2021]**
		example, class 3 obesity [BMI 40 kg/m^2 or more], cardiovascular disease, magnesium administration or obstructive sleep apnoea):
		• carry out hourly monitoring of oxygen saturations, respiratory rate and sedation for at least 12 hours after birth, **and then**
		• continue with routine postnatal observations in accordance with local protocols. **[2021, amended 2023]**
			cardiovascular disease and magnesium administration.
			
			The committee agreed that continuous pulse oximetry monitoring may interfere with the ability of a woman or person who has given birth to mobilise and care for their baby. They agreed that it was more appropriate to use hourly monitoring of oxygen saturations in combination with hourly monitoring of sedation and respiratory rate to detect respiratory depression.
			
			The committee agreed that heart rate, blood pressure, temperature and pain monitoring would be carried out as in usual postnatal protocols, but were not necessary every hour in order to detect respiratory depression and so simplified the recommendation by removing these.
				disease and magnesium administration have been added to the criteria. An increase in the number of people monitored is likely to increase costs. However, these costs will be offset to some extent as the revised recommendations will reduce the use of continuous pulse oximetry and the number of observations being carried out every hour for the purpose of detecting respiratory depression. The frequency of monitoring for respiratory depression has not changed.
				
				The overall resource impact of these is difficult to quantify but is likely to be broadly neutral.

5	Be aware that some pulse oximeters can underestimate	1.6.6 Take into account that some pulse oximeters can	The committee agreed to add additional information to the	Additional ways of monitoring for

	or overestimate oxygen saturation levels, especially if the saturation level is borderline. Overestimation has been reported in people with dark skin. See also the NHS England Patient Safety Alert on the risk of harm from inappropriate placement of pulse oximeter probes	underestimate or overestimate oxygen saturation levels, especially if the saturation level is borderline. Overestimation has been reported in people with dark skin so hypoxaemia may not be detected. Close attention to respiratory rate and sedation may therefore be needed to detect respiratory depression. Follow the NHS guidance on the use of pulse oximeters and the NHS England Patient Safety Alert on the risk of harm from inappropriate placement of pulse oximeter probes. **[2023]**	recommendation about overestimation in people with dark skin to advise healthcare professionals of the potential implications and what action could be taken to overcome this limitation.	respiratory depression may be used more for people with dark skin. No resource impact is anticipated from this change.
6	No current recommendation	1.6.7 Take into account that, compared to neuraxial diamorphine, neuraxial morphine is associated with an increased risk of respiratory depression over a longer period, so additional monitoring will be needed (see recommendations 1.6.8 and 1.6.10). **[2023]**	The committee agreed that as a result of the different pharmacokinetic properties of neuraxial morphine compared to neuraxial diamorphine, it was more likely to lead to respiratory depression over a longer period of time, and that this fact should be highlighted.	Increased awareness of the differences in risk and duration of respiratory depression between neuraxial morphine and diamorphine. No resource impact is anticipated from this change.

7	No current recommendation	1.6.8 For women or people who have given birth who have had intrathecal morphine (up to 0.1 mg) or epidural morphine (up to 3 mg) for caesarean birth, and who have known risk factors for respiratory depression (for example, class 3 obesity [BMI 40 kg/m^2 or more], cardiovascular disease, magnesium administration or obstructive sleep apnoea): • carry out hourly monitoring of oxygen saturations, respiratory rate and sedation for at least 12 hours after birth, **and then** • continue with 2 hourly monitoring for a further 12 hours. **[2023]**	Because of the long-lasting effects of neuraxial morphine and the increased risk of respiratory depression, the committee adopted the monitoring recommendations for the recommended doses of neuraxial morphine for people with risk factors developed by the Society for Obstetric Anaesthesia and Perinatology.	Women and people who have given birth will need increased monitoring after neuraxial morphine, compared to those who have received neuraxial diamorphine and this may need care to be given in an enhanced area on a postnatal ward. As morphine carries an increased risk of respiratory depression, an additional 12 hours of monitoring is recommended in higher risk groups or if there are concerns. As diamorphine shortages are unpredictable it is difficult to quantify the resource impact, but the increased monitoring for morphine does increase the staff resources required. The level of monitoring required may be difficult with current staffing

				levels, although this could be mitigated if the checks were undertaken by a maternity support worker or health care assistant (typically Agenda for Change Band 3). Although the use of morphine is not expected to lead to longer hospital stays, the level of monitoring would require the woman or person who has given birth to stay on a high dependency ward.
8	1.6.6 For a woman who has had spinal or epidural diamorphine for caesarean birth, but is not at an increased risk of respiratory depression, carry out routine observations in accordance with local protocols. **[2021]**	1.6.9 For women and people who have given birth who have had intrathecal or epidural diamorphine for caesarean birth, and do not have any known risk factors for respiratory depression, carry out routine postnatal observations in accordance with local protocols. **[2021, amended 2023]**	The wording has been amended and improved, but no changes in meaning have been made.	Wording changes only so no impact.

9	No current recommendation	1.6.10 For women or people who have given birth who have had intrathecal morphine (up to 0.1 mg) or epidural morphine (up to 3 mg) for caesarean birth and who do not have any known risk factors for respiratory depression: • carry out 2 hourly monitoring of oxygen saturations, respiratory rate and sedation, for at least 12 hours, **and then** • continue with routine postnatal observations in accordance with local protocols. **[2023]**	Because of the long-lasting effects of neuraxial morphine and the increased risk of respiratory depression, the committee adopted the monitoring recommendations for neuraxial morphine for people without risk factors developed by the Society for Obstetric Anaesthesia and Perinatology.	Women and people who have given birth will need increased monitoring after neuraxial morphine, compared to those who have received neuraxial diamorphine and this may need care to be given in an enhanced area on a postnatal ward. As morphine carries an increased risk of respiratory depression, 12 hours of monitoring is recommended in in those without risk factors. As diamorphine shortages are unpredictable it is difficult to quantify the resource impact, but the increased monitoring for morphine does increase the staff resources required. The level of monitoring required may be difficult with current staffing levels, although this could be mitigated if the

				checks were undertaken by a maternity support worker or health care assistant (typically Agenda for Change Band 3). Although the use of morphine is not expected to lead to longer hospital stays, the level of monitoring would require the woman or person who has given birth to stay on a high dependency ward.
10	1.6.7 When deciding on the location and frequency of monitoring for respiratory depression in women who have had spinal or epidural diamorphine for caesarean birth, take into account other factors that could affect monitoring needs (for example, a complicated birth, or unstable observations in first 2 hours after birth). **[2021]**	This recommendation has been deleted.	The committee agreed that the recommendations on monitoring women and people who have given birth, with or without risk factors, after neuraxial morphine or diamorphine were now more detailed. Consequently an additional recommendation about taking into account other risk factors was not necessary, particularly when these risk factors are not well-defined.	The level of monitoring after neuraxial diamorphine or morphine will be more standardised in the NHS, based on defined schedules. As this recommendation has been deleted it will not have a resource impact.

11	1.6.8 Ensure women who have patient-controlled analgesia with opioids after caesarean birth have routine hourly monitoring of respiratory rate, sedation and pain scores throughout treatment, and for at least 2 hours after discontinuation of treatment. [2004, amended 2021]	Moved to after recommendation 1.6.11 (see below)	See below	See below
12	1.6.12 Consider intravenous patient-controlled analgesia (PCA) using morphine for women who have had a general anaesthetic for caesarean birth. If intravenous PCA is not acceptable to the woman or the pain is less severe, consider oral morphine sulfate. **[2021]**	1.6.11 Consider intravenous patient-controlled analgesia (PCA) using morphine for women and people who have given birth who have had a general anaesthetic for caesarean birth. If intravenous PCA is not acceptable to the woman or person who has given birth, or the pain is less severe, consider oral morphine sulfate. **[2021]**	No changes made.	No changes made.
13	1.6.8 Ensure women who have patient-controlled analgesia with opioids after caesarean birth have routine hourly monitoring of respiratory rate, sedation	1.6.12 Ensure women and people who have given birth who have patient-controlled analgesia with opioids after caesarean birth have routine hourly monitoring of oxygen	The recommendation relating to the monitoring of women and people who have given birth receiving patient-controlled opioids has been moved to be adjacent to the recommendation	Women and people who have given birth having patient-controlled analgesia will have oxygen saturations measured

	and pain scores throughout treatment, and for at least 2 hours after discontinuation of treatment. **[2004, amended 2021]**	saturations, respiratory rate, sedation and pain scores throughout treatment, and for at least 2 hours after discontinuation of treatment. **[2004, amended 2023]**	about considering patient-controlled opioids. Pulse oximeter oxygen saturation has been included as a monitoring parameter as this is one of the respiratory monitoring modalities used in conjunction with respiratory rate and sedation assessment.	which will improve safety. As other hourly observations will also be taking place, the resource impact of this is likely to be small.