

The Timing of Urinary Catheter Removal after Caesarean Section - Presentation Narrative.

I have some audit data to present today regarding the timing of urinary catheter removal after caesarean section.

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There are 3 main reasons why a catheter is inserted prior to caesarean section. None of them will come as a surprise to anyone.

1. Emptying the bladder helps protect it from injury during surgery
2. Emptying the bladder improves visualisation of the surgical field
3. Central neuraxial blocks, such as spinals or epidurals can cause urinary retention and distension injuries.

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The timing of catheter removal after caesarean section is of interest because catheters have a risk of complications or unwanted effects. These include:

- Increased incidence of UTI
- Urethral pain
- Voiding difficulties following removal
- Delayed mobilisation
- Increased length of hospital stay.

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The aim of the audit is to help inform best practice regarding the timing of urinary catheter removal after caesarean section.

I have 2 sets of data to present.

The first set of data was collected by Libby Slemeck in March 2014 prior to the introduction of the enhanced recovery program for low risk elective caesarean sections. The second set of data was collected by me in December 2014 following the introduction of the enhanced recovery program for low risk elective caesarean sections. A third set of data will be available in the future for both elective and emergency caesarean sections enrolled in the enhanced recovery program. Debbie is in the process of collecting this data.

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Lets look a Libby's data first. The data was collected over a one month period from 4th March 2014 to 4th April 2014. The plan was that all low risk women undergoing elective caesarean section would have the date and time of their urinary catheter insertion and removal recorded on a data collection form by the midwife looking after them. In addition, if re-catheterisation was required this would also be recorded.

42 women were identified from the delivery record book on labour ward as eligible for inclusion. All 42 had their urinary catheter insertion date and time recorded. However, only 31 (74%) had their urinary catheter removal date and time recorded. Therefore, there is a risk that the data is not properly representative.

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For the 31 women with complete data, the distribution of the length of time the catheter was in-situ is shown here.

The mean length of time a catheter was in-situ was 17.8 hours with a standard deviation of 3.5 hours. However, as the data is not normally distributed, technically we should use the median as the measure of central tendency and the interquartile range as the measure of spread. The median length of time a catheter was in-situ was 19 hours with an interquartile range of 4.6 hours (1st quartile 15 hours, 3rd quartile 19.6 hours).

What do all these numbers actually mean? Well, if you look at the data in a different way it becomes very clear.

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The distribution for the time of day at which the catheters were removed is shown here. This clearly demonstrates that the vast majority of catheters were being removed in the morning after the day of surgery, irrespective of the time of day the caesarean section was performed.

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The need for re-catheterisation was recorded for 2 women. One of these women had her second catheter successfully removed after 24 hours whilst the other was discharged home with a catheter in-situ. Because not all of the data collection forms were filled in completely, the re-catheterisation rate could optimistically range from 2/42 (4.8%) to 2/31 (6.5%) but could be higher.

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Now let's look at my data. Compared to Libby, I used a different method for data collection. I pulled the medical notes of all low risk women undergoing elective caesarean section who had been enrolled in the enhanced recovery program up until the time of my data collection in December 2014. I then extracted the information I required from the post-natal care record. Sadly, only 27, around half, of the medical notes contained the post-natal care record. Again, this introduces a risk that the data is not properly representative.

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For the 27 women whose post-natal care record was available, the distribution of the length of time the catheter was in-situ is shown here.

Again, the data is not normally distributed but I have included the mean and standard deviation as these are the measures of central tendency and spread that people are most familiar with. The mean length of time a catheter was in-situ was 9.8 hours with a standard deviation of 5.7 hours. The median length of time a catheter was in-situ was 7 hours with an interquartile range of 5 hours (1st quartile 6 hours, 3rd quartile 11 hours).

What do all these numbers actually mean? To answer that question we need to compare them with Libby's data.

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From the table it is clear that the introduction of the enhanced recovery program for low risk women undergoing caesarean section had two effects on catheter removal.

1. It led to a reduction in the length of time urinary catheters were in-situ.
2. It meant that urinary catheters were no longer simply being removed at a convenient time of day.

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However, there are still two questions which need to be answered?

1. Why aren't all women having their catheters removed at 6 hours as per the enhanced recovery program?
2. Has the earlier removal of catheters led to a change in the rate of re-catheterisation?

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To answer the first question I looked in more detail at the 8 women whose catheter was in-situ for more than 10 hours. This is what I found. For 2 women there was a clear plan in the notes to leave the catheter in-situ for longer due to postpartum bleeding. For a further 2 women you could surmise from the medical notes that the catheter had been left in-situ for longer due to postpartum bleeding. The catheter was left in-situ for longer for 2 women at the request of the women. I could find no clear reason why the catheter had been left in-situ longer for the final 2 women.

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Regarding the rate of re-catheterisation, there were 2 women in my data who needed to be re-catheterised. The first woman had her catheter removed at 17:10, subsequently went into retention and so had an in out catheter at 03:00 hours with 1100ml of urine drained. She then developed retention again and so a catheter was reinserted at 08:30. This catheter was left in-situ for 36 hours and subsequently removed without incident. The second woman had her catheter removed at 15:35, subsequently went into retention and so had a catheter reinserted at 22:00 hours. This catheter was successfully removed at 10:10.

Therefore, the re-catheterisation rate is 7.4% (2/27), which is not dissimilar to the rate found by Libby of 4.8-6.5%.

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In Conclusion. The introduction of the enhanced recovery program for low risk women undergoing caesarean section has led to a reduction in the length of time that urinary catheters are in-situ without increasing the need for re-catheterisation. You would imagine that this has also led to a reduction in complications and unwanted effects from the catheters but I cannot support this with any data. Ongoing data collection is now underway to capture all women undergoing caesarean section, not just low risk elective cases.

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