



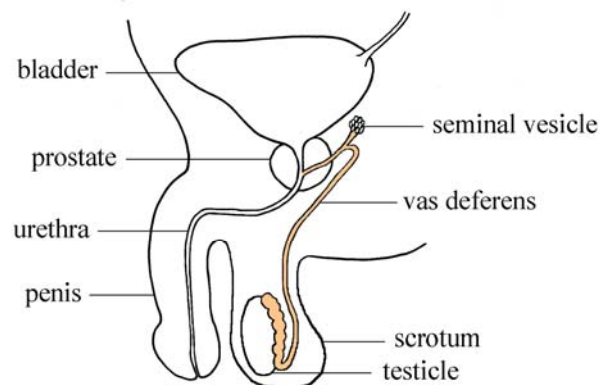
Consumer summary

Post-vasectomy testing to confirm sterility

To navigate in this document in Word, click on the word (underlined in blue) to link to glossary. When using the PDF version, please scroll to the end of the document for definitions of glossary words underlined in blue.

[Post-vasectomy](#) testing is carried out to check that a [vasectomy](#) has been successful. A [vasectomy](#) is a surgical procedure undertaken to render a man sterile (unable to father children). The procedure involves cutting the tubes ([vas deferens](#)) that carry [sperm](#) from the testicles (see figure 1), preventing it from mixing with semen, the fluid produced in the seminal vesicles and then ejaculated. ASERNIP-S has reviewed the available published [evidence](#) to determine how testing should be conducted to confirm sterility.

Figure 1: Male anatomy



What does post-vasectomy testing involve?

[Vasectomy](#) is considered a very safe and effective method of contraception, with failure rates generally quoted as between 0% and 2%. The success or failure of a [vasectomy](#) can be determined after the operation by testing the [semen](#) ejaculated by the patient to see whether it contains [sperm](#). If the [vasectomy](#) has been successful, there will be no [sperm](#) in the [semen](#). Testing for [sperm](#) after a [vasectomy](#) is called [post-vasectomy semen analysis \(PVSA\)](#). In an alternatively test procedure, a small piece of [vas deferens](#) is cut away and examined under a microscope to check that it has been divided. [PVSA](#) is, however, considered a much better indicator of [vasectomy](#) success than the vas deferens test procedure.

Current questions concerning PVSA

There is a lack of agreement amongst practitioners concerning some aspects of [PVSA](#) testing.

- *The number and timing of tests*

Traditionally, two [PVSA](#) tests have been recommended at between 12 and 16 weeks [post-vasectomy](#) and after at least 20 [ejaculations](#). However, many practitioners recommend only one test, in some cases after a much shorter time, such as four weeks.

- *How to measure vasectomy success*

A [vasectomy](#) is considered to be a success if it leads to [azoospermia](#) (the absence of [sperm](#) in the [semen](#)). However, studies suggest that [sperm](#) can lose their ability to fertilise a female egg before [azoospermia](#) is reached. In these cases the sperm are non-motile or unable to move independently to the female egg and are therefore unlikely to cause pregnancy. Thus patients may be able to rely on [vasectomy](#) for contraception before [PVSA](#) testing confirms [azoospermia](#).

What is the available published evidence?

In order to make recommendations on testing to confirm sterility after [vasectomy](#), the review group considered:

1. *The appropriate endpoint of vasectomy (azoospermia or loss of sperm motility?)*
[Azoospermia](#) appears to be a more reliable measure than loss of [sperm](#) motility, which can only be measured if the sample is delivered to the laboratory and examined within a certain time.

2. *The time taken, or number of ejaculations needed, to clear the vas deferens of existing sperm after vasectomy*

- The percentage of patients reaching [azoospermia](#) by their first test varied greatly depending on when the test took place e.g. 51% to 98% of patients reached [azoospermia](#) when first tested at three months.
- In more than half the studies, at least 80% of men reached [azoospermia](#) when first tested from three months onwards.
- For patients undergoing a second test, there was always an increase in the percentage of patients reaching [azoospermia](#) between the first and second test. When first tests were performed later, this increase got smaller.
- Between 11 and 20 [ejaculations](#) were required to reach [azoospermia](#) in 80% of patients.

The [evidence](#) suggests that approximately 80% of patients are [azoospermic](#) after three or four months and after about 20 [ejaculations](#).

3. *The reappearance of sperm (motile or non-motile, permanent or temporary).*

- One study reported temporary reappearance of [motile sperm](#) in seven patients (up to four months [post-vasectomy](#)), but [azoospermia](#) was reached again in all cases.
- The reappearance of [non-motile sperm](#) after [azoospermia](#) was reported in seven studies, up to 22 months [post-vasectomy](#) and up to 17 months after [azoospermia](#) had been demonstrated.

[Motile sperm](#) can reappear in the [semen](#) due to recanalisation (see point 4 below).

Reappearance of [non-motile sperm](#) can result from [sperm](#) being stored in the [vas deferens](#) or the failure to detect [sperm](#) in an earlier test. The reappearance of [sperm](#) will only be detected if a second test is performed. Only a small proportion of patients demonstrate the reappearance of [sperm](#), and in many cases it is temporary with [azoospermia](#) eventually reached.

4. *Recanalisation (early and late).*

- Uncommonly the ends of the [vas deferens](#) rejoin (called recanalisation). In the studies in this review, recanalisation was diagnosed in patients as early as one month and as late as 12 years after [vasectomy](#) (but this can be difficult to distinguish from cases where [azoospermia](#) was never reached).

Although we cannot tell when early recanalisation is likely to occur, in most cases [motile sperm](#) had been detected in the initial [post-vasectomy semen](#) tests. Late recanalisation can occur at any point after [azoospermia](#) has been reached.

5. *Pregnancies*

There were 69 pregnancies reported in 20 studies, regardless of the [PVSA](#) protocol employed. In the 13 studies that reported on the number of vasectomies, 60 pregnancies were recorded out of 92 184 vasectomies (0.07%). Of the total 69 pregnancies, 27 patients had demonstrated [azoospermia](#) in at least one [PVSA](#) test; however, only 7 of these (25.9%) had paternity confirmed by DNA analysis. Further [semen](#) analyses were reported for 22 patients after pregnancy was confirmed: [motile sperm](#) was found in 10 cases, [non-motile sperm](#) in 2 cases and 10 were [azoospermic](#).

What are the conclusions and recommendations?

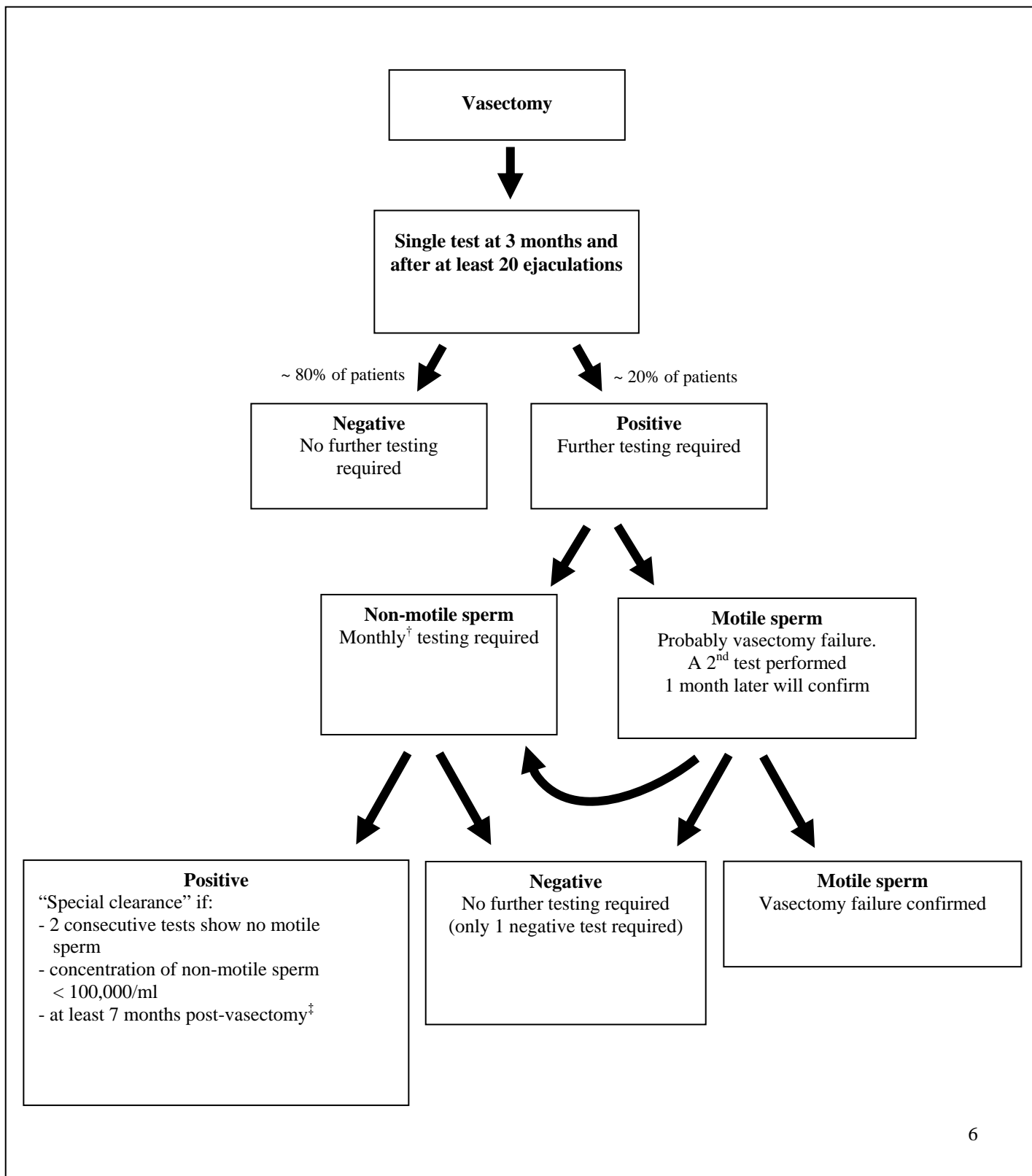
After considering the [evidence](#) presented in this review, the review group recommended the following [PVSA](#) plan or protocol (see figure 2):

- [Post-vasectomy](#) testing occurs with only one [azoospermic](#) test at three months and after a minimum of 20 [ejaculations](#) (an earlier test cannot be recommended on the poor evidence available).
- If the [semen](#) sample is [azoospermic](#) at three months (i.e. the test is negative), the patient can be considered sterile and no further follow-up is necessary.
- If a sample contains [sperm](#) at the three month test (i.e. the test is positive), further tests are required.
- If [motile sperm](#) are present, the [vasectomy](#) is probably a failure and another test one month later will confirm this (and a decision can be made about [re-vasectomy](#)).
- If [non-motile sperm](#) are present, further tests should be performed monthly until either an [azoospermic](#) sample is provided or “special clearance” (due to persistent [non-motile sperm](#)) can be given. Special clearance could be given when the patient has provided two samples in a row containing < 100,000 [sperm](#)/ml (non-motile) at least seven months [post-vasectomy](#).
- Approximately 80% of patients would be cleared after one test and the remaining 20% can continue follow-up until cleared, as described above.
- [Vasectomy](#) failures will be detected at the three month test, and hence histological testing of the [vas deferens](#) is not necessary (however, it may be useful in a training situation).

Figure 2: Flow chart of the proposed post-vasectomy testing protocol

† The proposal of monthly testing after a positive sample is not evidence-based. It is an arbitrary time period chosen to potentially allow enough time and ejaculations to clear the vas deferens of any remaining sperm.

‡ The pre-requisites for special clearance in this proposal have been based on those in the British Andrology Society guidelines of post-vasectomy semen analysis.



According to the ASERNIP-S Classification System, the evidence available on [PVSA](#) protocols was of poor quality. The ASERNIP-S review group considers that more research is required to further improve the protocol of [post-vasectomy semen](#) testing.

Acknowledgments

Figure 1 was prepared by Kathrin Hohloch.

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Important note The information provided is based on up-to-date research. However, it is not intended to replace the advice of your medical practitioner. Please ask your doctor if you have any further questions about the management of this condition.

For further information about ASERNIP-S

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(For information on the use of figures in health information, click on ‘Help your patients understand risk’ at <https://www.besttreatments.org> – accessed 21/03/05.)

ASERNIP-S is a programme of the Royal Australasian College of Surgeons (RACS).

POST-VASECTOMY TESTING TO CONFIRM STERILITY

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The ASERNIP-S Classification System

Evidence Rating

The [evidence](#) (i.e. studies included in the review) for ASERNIP-S [systematic reviews](#) is rated as *Good*, *Average* or *Poor*, according to the:

- quality of the [evidence](#). High quality [evidence](#) comes from a study that has a low risk of [bias](#) and no other major flaws (such as lack of enough follow-up data or big differences between the patients selected for the groups).
 - availability of the [evidence](#). This refers to how much [evidence](#) there is to obtain.
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Good

Most of the [evidence](#) is either from:

- a high quality [systematic review](#) of all relevant [randomised controlled trials](#), or
- at least one large high quality [randomised controlled trial](#).

Average

Most of the [evidence](#) is from:

- high quality [quasi-randomised trials](#), and/or
- comparative studies, without major flaws, in which the patients are placed into groups without being randomized, and/or
- an inconclusive [systematic review](#) based on small [randomised controlled trials](#), and/or
- [randomised controlled trials](#) that are of moderate or uncertain quality.

The results of these studies are more likely to be influenced by other factors compared to high-quality [randomised controlled trials](#). However, these studies show to some extent that there is still a reasonable chance (moderate probability) that outcomes are valid.

Poor

Most of the [evidence](#) is from:

- [case series](#)
- studies mentioned above, with major flaws or a high risk of [bias](#)
- studies in which there is not enough [evidence](#).

Glossary

Azoospermia: the absence of [sperm](#) in the [semen](#)

Bias: The influence of other factors, i.e. those not being measured, on the results of a study.

Case series: A series of single patients, usually treated at the same centre within a particular timeframe. This often reflects the historical experience of that centre.

Ejaculation: [semen](#) is expelled from the male urethra

Evidence: the studies included in the review

Motile sperm: [sperm](#) that can move towards and fertilize the female egg

Non-motile sperm: [sperm](#) that cannot move independently towards the female egg

Post-vasectomy: after the [vasectomy](#)

PVSA: [post-vasectomy semen](#) analysis

Quasi-randomised trial: A trial using a method which is not completely randomised of placing patients into treatment groups. There is a greater risk of selection [bias](#) in quasi-random trials where placement is not adequately concealed compared with [randomised controlled trials](#) with adequate allocation concealment.

Randomised controlled trial: A study in which researchers randomly place participants in groups. The new surgical procedure will be performed on one group of patients, while the other group of patients will undergo the conventional operation. Researchers measure and compare the outcomes of the patients from the different groups.

Semen: fluid produced in the seminal vesicles

Sperm: male reproductive cells which combine with the female reproductive egg to form an embryo

Systematic review: ASERNIP-S conducts literature reviews on the safety and effectiveness of new surgical techniques before they are widely accepted into the health care system. Each review collects all relevant information, or [evidence](#), on new and standard techniques used to treat a medical condition. The quality of [evidence](#) is assessed. ASERNIP-S then makes recommendations on the safety and effectiveness of the procedures that are then endorsed by RACS.

Vas deferens: tubes that carry [sperm](#) from the testicles

Vasectomy: a surgical procedure to cut the tubes ([vas deferens](#)) that carry [sperm](#) from the testicles