

male, is composed of 2 corpora cavernosa (they begin with the crura) and the female corpus spongiosum (glans, bulbs, corpus spongiosum or pars intermedia and labia minora).<sup>6</sup> The corpus spongiosum of the female urethra also exists,<sup>1,2</sup> and can be considered part of the female penis. This new anatomical terminology of the female vulva is important in sexology. The female orgasm, as in the male, is always caused by the female penis.<sup>6</sup>

Respectfully,  
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1. Testut, L. and Latarjet, A.: Apparato urogenitale. Organi genitali della donna; vulva. In: Trattato di Anatomia Umana, 11th ed. Torino: UTET, vol. 6, chapt. 3, art. V, pp. 532–549, 1972
2. Chiarugi, G. and Bucciante, L.: Apparecchio uro-genitale. Apparecchio genitale femminile; pudendo muliebre. In: Istituzioni di Anatomia dell'Uomo. Milano: Casa editrice Dr. Francesco Vallardi—Società Editrice Libreria, vol. 3, part 9, appar. 3, chapt. 16, pp. 863–874, 1975
3. Bannister, L. H. and Dyson, M.: Apparati della riproduzione. Apparato genitale femminile; organi genitali esterni femminili. In: Anatomia del Gray. Edited by P. L. Williams, L. H. Bannister, M. M. Berry, P. Collins, M. Dyson, J. E. Durrek et al. Bologna: Zanichelli, vol. 3, chapt. 3169, pp. 14.34–14.35, 2001
4. Sevely, J. L.: The male clitoris. *Am J Obstet Gynecol*, **159**: 533, 1988
5. Van Turnhout, A. A., Hage, J. J. and Van Diest, P. J.: The female corpus spongiosum revisited. *Acta Obstet Gynecol Scand*, **74**: 767, 1995
6. Puppo, V.: Revisione dell'anatomia dei genitali esterni femminili. Il pene femminile. *La nuova sessuologia. Riv Sci Sessuol*, **15**: 5, 2002

## Re: How Little is Enough? The Evidence for Post-Vasectomy Testing

**T. Griffin, R. Tooher, K. Nowakowski, M. Lloyd and G. Maddern**

*J Urol*, **174**: 29–36, 2005

**To the Editor.** The article by Griffin et al on post-vasectomy semen analysis (PVSA) is a state-of-the-art systematic review but their proposed flow chart does not consider evidence published after March 2003. Several studies with bearing on this issue have been published recently.<sup>1–6</sup> Therefore, we offer a modified protocol for PVSA based on the most recent evidence (see figure).

We agree with conducting the first PVSA at 3 months postoperatively. However, this juncture may be unnecessarily late. After adequate vas occlusion, which is best achieved with cautery and/or fascial interposition,<sup>1</sup> the motility and fertilizing ability of the sperm are lost by 3 weeks, as mentioned in the Australian Safety and Efficacy Register for New Interventional Procedures—Surgical report.<sup>7</sup> If early recanalization occurs, it usually happens within the first month or so after vasectomy.<sup>3,4</sup> Further research is needed regarding the optimal timing of the first PVSA when highly effective occlusion techniques are used.<sup>2,8</sup>

A minimal number of ejaculations is an unnecessary requirement. More men achieved azoospermia or severe oligospermia

(less than 100,000 sperm per ml) by 12 weeks, irrespective of the number of ejaculations, than by 20 ejaculations.<sup>3,4</sup>

We recommend using 100,000 or fewer nonmotile sperm per ml as the cutoff for when men can rely on the vasectomy for contraception. Among a prospective cohort of 389 men whose vasectomy was performed using cautery with or without fascial interposition approximately 95% had less than 100,000 sperm per ml at 12 weeks.<sup>3</sup> Moreover, 99.7% of these cases were considered to be successes at 24 weeks.<sup>3</sup> The British Andrology Society guidelines<sup>9</sup> do not explicitly state a 10,000 sperm per ml cutoff for “special clearance,” but mention that failure should be suspected when there are 100,000 or more sperm per ml. A serious limitation of the original article suggesting a cutoff of 10,000 sperm per ml is that it did not include a description of semen analysis methods.<sup>10</sup> Preliminary results from Steward et al (unpublished data) suggest that noncentrifuged semen samples categorized as azoospermic commonly have some sperm if examined after centrifugation but usually less than 100,000 nonmotile sperm per ml.<sup>6</sup> The risk of pregnancy with less than 100,000 nonmotile sperm per ml is extremely low.<sup>2,11,12</sup>

As mentioned by Griffin et al, evidence for the optimal interval to PVSA is lacking. We recommend a 4 to 6-week period.<sup>2,13</sup>

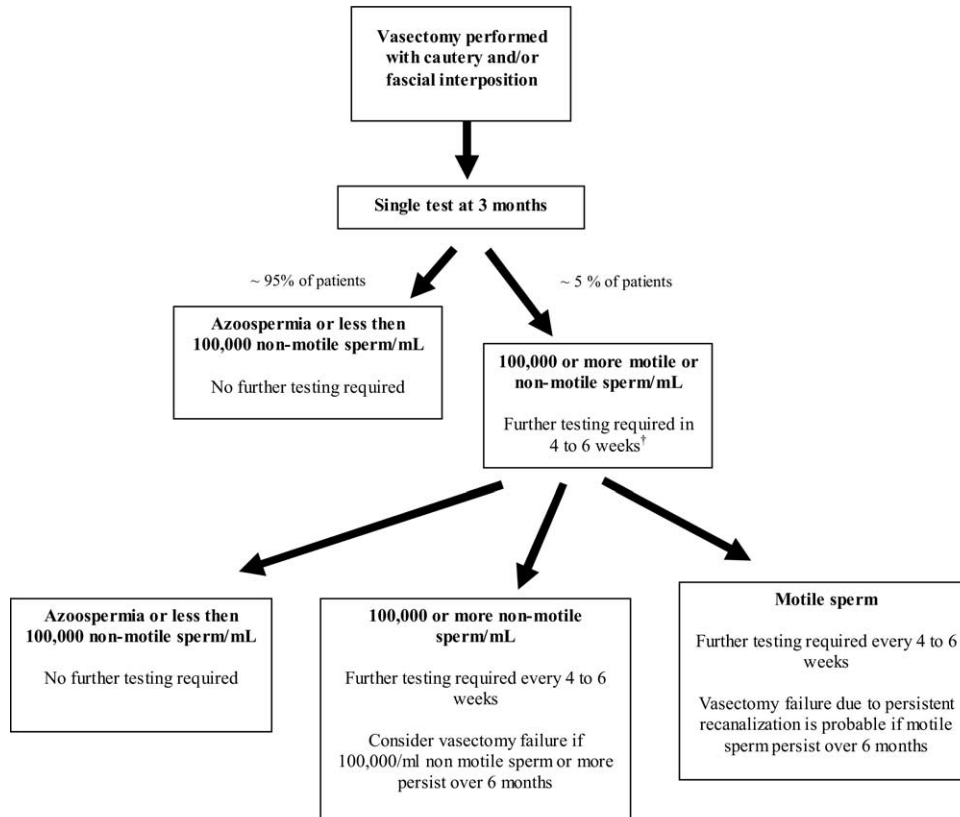
When motile sperm are present at 3 months early recanalization is probable. Other less likely reasons are surgical error and vas duplication. However, recanalization does not automatically imply a failure, as suggested by Griffin et al. A recent study showed that 56% of men (95% CI 51% to 62%) with a first PVSA done at about 14 weeks and showing motile sperm had a successful vasectomy (defined as no pregnancy) after an average followup of 7 years.<sup>2</sup> Repeat vasectomies were limited to men with increasing numbers of motile sperm on subsequent PVSA or with motile sperm at 6 months after vasectomy.<sup>2</sup> Men with 100,000 or more nonmotile sperm per ml 6 months after vasectomy may be considered to have treatment failure but this cutoff may be overly cautious.<sup>8,14</sup> The flow chart shown in the figure should further decrease unnecessary PVSA, and should be reviewed as new evidence becomes available.

Respectfully,  
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1. Labrecque, M., Dufresne, C., Barone, M. A. and St.-Hilaire, K.: Vasectomy surgical techniques: a systematic review. *BMC Med*, **2**: 21, 2004
2. Labrecque, M., St.-Hilaire, K. and Turcot, L.: Delayed vasectomy success in men with a first postvasectomy semen analysis showing motile sperm. *Fertil Steril*, **83**: 1435, 2005



<sup>†</sup> The timing of 4-6 weeks for repeat 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.

Evidence based flow chart of post-vasectomy testing protocol

- Barone, M. A., Irsula, B., Chen-Mok, M., Sokal, D. C. and Investigative Study Group: Effectiveness of vasectomy using cautery. *BMC Urol*, **4**: 10, 2004
- Barone, M. A., Nazerali, H., Cortes, M., Chen-Mok, M., Pollack, A. E. and Sokal, D.: A prospective study of time and number of ejaculations to azoospermia after vasectomy by ligation and excision. *J Urol*, **170**: 892, 2003
- Sokal, D., Irsula, B., Chen-Mok, M., Labrecque, M. and Barone, M. A.: A comparison of vas occlusion techniques: cautery more effective than ligation and excision with fascial interposition. *BMC Urol*, **4**: 12, 2004
- Sokal, D., Irsula, B., Hays, M., Chen-Mok, M., Barone, M. A. and Investigator Study Group: Vasectomy by ligation and excision, with or without fascial interposition: a randomized controlled trial [ISRCTN 77781689]. *BMC Med*, **2**: 6, 2004
- Griffin, T., Tooher, R., Nowakowski, K., Lloyd, M. and Maddern, G.: Post-vasectomy testing to confirm sterility: a systematic review. Adelaide, South Australia: ASERNIP-S, Report No. 3, 2003
- Edwards, I. S.: Earlier testing after vasectomy, based on the absence of motile sperm. *Fertil Steril*, **59**: 431, 1993
- Hancock, P., McLaughlin, E. and British Andrology Society: British Andrology Society guidelines for the assessment of post vasectomy semen samples (2002). *J Clin Pathol*, **55**: 812, 2002
- Davies, A. H., Sharp, R. J., Cranston, D. and Mitchell, R. G.: The long-term outcome following "special clearance" after vasectomy. *Br J Urol*, **66**: 211, 1990
- Haldar, N., Cranston, D., Turner, E., MacKenzie, I. and Guillebaud, J.: How reliable is a vasectomy? Long-term follow-up of vasectomised men. *Lancet*, **356**: 43, 2000
- Contraceptive efficacy of testosterone-induced azoospermia and oligozoospermia in normal men. *Fertil Steril*, **65**: 821, 1996
- Labrecque, M., Nazerali, H., Mondor, M., Fortin, V. and Nasution, M.: Effectiveness and complications associated with 2 vasectomy occlusion techniques. *J Urol*, **168**: 2495, 2002
- De Knijff, D. W., Vrijhof, H. J., Arends, J. and Janknegt, R. A.: Persistence or reappearance of nonmotile sperm after vasectomy: does it have clinical consequences? *Fertil Steril*, **67**: 332, 1997

**Reply by Authors.** Labrecque et al raise the point that our proposed flow chart does not consider evidence published after March 2003. It is true that the literature searches for our systematic review were completed at that point. Full systematic reviews are lengthy and laborious processes, and journal review and publication times are not always as rapid as we would like. These issues often mean that searches in systematic reviews appear somewhat dated once an article is published in the peer reviewed literature. We appreciate that the authors have brought these new articles to our attention, and are pleased that this research can contribute to and refine the suggested protocol for the expensive process of post-vasectomy testing.