

OSAC RESEARCH NEEDS ASSESSMENT FORM



Title of research need:	Speculum-Assisted versus Blind Deep Vaginal Swabbing for DNA Recovery in Sexual Assault Cases
Keywords:	Swab, sexual assault, DNA recovery

R&D Need Rank:

Low, Medium, High

Medium

**SAC Approved
Date:**

9/15/2025

Submitting subcommittee(s):

Forensic Nursing

Research Need Summary:

The purpose of these research needs is to build a stronger scientific foundation for forensic science standards. The information provided herein will help to evaluate and strengthen existing standards, and/or fill any standards related gaps. In the space below, please provide a brief narrative of the need to be addressed. This should include:

- The identity of any specific standards that would be affected/improved/evaluated
- A discussion on gaps that exist within the standards or standards related gaps that need to be filled
- How this work would fill those gaps
- An overview of any current or past research efforts that may be relevant to this effort
- A discussion regarding how this research might improve current laboratory capabilities and/or forensic services within the criminal justice system
- Any relevant references

Research has established optimal time frames for DNA collection from the vagina and cervix with spermatozoa present for extended periods of time in the cervix versus the vagina. (Gould, J. E., Overstreet, J. W., & Hanson, F. W. (1984). Assessment of human sperm function after recovery from the female reproductive tract. *Biology of reproduction*, 31(5), 888–894. <https://doi.org/10.1095/biolreprod31.5.888>)

Post-coital DNA recovery windows were extended given improvements in profile identification. (Speck, P., & Ballantyne, J. (2014). Document Title: Post-Coital DNA Recovery Study.)

Optimal swabbing techniques to maximize recovery have been conducted. (Hedman, J., Jansson, L., Akel, Y., Wallmark, N., Gutierrez Liljestrang, R., Forsberg, C., & Ansell, R. (2020). The double-swab technique versus single swabs for human DNA recovery from various surfaces. *Forensic science international. Genetics*, 46, 102253. <https://doi.org/10.1016/j.fsigen.2020.102253>)

Speculum examinations are the most invasive aspect of a forensic medical exam and can cause pain and potentially additional trauma if either not done correctly or are done in circumstances in which someone has injuries to external or hymenal structures. A recent study shows limited additional value in identification of injury with speculum use with 18 of 1000 (1.8%) of cases showing superficial wounds, 8 cases; bruises, 10 cases. Half of those cases (9/18) had external pelvic injury. (Chariot, P., Duchesne, S., & Denis, C. (2024). Speculum use during pelvic examination of women who report sexual assault. *American Journal of Obstetrics & Gynecology*, 231(4), e146-e147.)

Research Recommendation: Speculum-Assisted versus Blind Deep Vaginal Swabbing for DNA Recovery in Sexual Assault Cases

The Evidence Gap: Current forensic protocols lack empirical data comparing DNA recovery rates between speculum-assisted visualization and blind deep vaginal swabbing techniques. This knowledge deficit leaves forensic examiners

without evidence-based guidance on when the additional invasiveness of speculum examination is justified by improved DNA yield.

Research Objective: To conduct a comparative effectiveness study determining whether speculum-assisted direct visualization of the cervix and posterior fornix yields statistically significant improvements in DNA detection, quality, and probative value compared to standard blind deep vaginal swabbing.

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.