

Oral sex will be defined as any instance where one party's mouth comes in contact with the genital area, breast area, or anal area of another party.

When oral sex is at issue, how does Forensic Science address it?

What the forensic examiner is looking for to confirm oral sex is transfer evidence particular to oral sex (i.e.- sperm, semen, saliva, hair, or bite marks).

This evidence should be collected from the victim and/or the suspect, along with the appropriate control samples.

Often in a sexual assault or rape protocol, fluid evidence will be collected in the form of swabs taken from the victim to complete a rape kit, or from stains taken from the victim's clothing.

A suspect's clothes may be available to search for stains, or a swab may be taken from a suspect's mouth or penis.

Oral, vaginal and anal swabs are the most likely to yield strong positive results for fluid transfer evidence.

### **SPERM**

With experience sperm can be microscopically identified with accuracy by their morphological characteristics.

A magnification of 400x to see just the heads of sperm is needed.

Staining techniques are fairly standard (Keating recommends staining suspected sperm in Haematoxylin and Eosin).

The question of whether or not to confirm the presence of sperm when only heads and no tails are visible remains an issue.

For the more conservative examiner, both the heads and tails of sperm should be visually identified to make the call.

Some of the more liberal examiners believe that they can determine with certainty the difference between a sperm head with no tail, and something that does a good impersonation of a sperm head with no tail.

Somewhere between the conservative and the liberal opinion lies the moderate, who will only call heads if there are a lot of them.

At any rate, opinions remain mixed on this point.

If sperm is confirmed on a stained slide made from an oral swab, that's a positive result for oral sex.

Microscopic confirmation of sperm from other swabs (i.e.-anal or vaginal) does not confirm oral sex.

Microscopic confirmation of sperm in the victim's or suspect's hair, or on the clothes up around the shoulders and neck is consistent with, but not proof of oral sex.

Unlike an already dried stain on a nonporous surface, there is an urgent time factor involved in the recovery of sperm from a victim's orifices.

There is no definite time scale for the identification of sperm in a body cavity, but "a number" of days can pass between time of death and time of examination with identifiable sperm being present.

In fact, Wilson reports a case where sperm is identified after 16 days in the vagina of a dead body.

However, in a live body in the oral cavity, when saliva, swallowing and normal enzymatic processes are present, the chances for finding sperm decrease far more rapidly.

Lee also reminds us that increased heat is detrimental to most proteins and enzymes.

Estimates for the survival of sperm in a living victim will vary with climate, individual metabolism, bathing habits, and general orifice conditions.

## **SEMEN**

Semen is the most common form of body fluid evidence encountered or sought in sexual assault cases.

It is the fluid mixture of bodily secretions which contains the sperm.

There are certain secretions in semen which are considered to be reliable markers for confirming the presence of semen, due either to uniqueness or quantity.

These markers are categorized by the results of the tests performed to assay them as either presumptive or conclusive.

Using these markers, forensic examiners are able to make reasonable statements about the presence of semen in a sample of evidence.

**Acid Phosphatase-** The acid phosphatase (AP) test is a well documented presumptive assay for the presence of semen

One quick way to test AP is by a yes/no determination with a color change for positive results (i.e.- Brentamine fast Blue B [9]).

Swab turns color, AP is present--swab doesn't turn color, AP is not present.

The problem here is that there is no regard for amount. What you get is something that has AP in small amounts, but not enough to say it might have come from semen.

You can get a positive with very little AP present using a yes/no test, so some examiners agree that this alone is not sufficient.

However, the quantitative AP test is still an excellent presumptive field test, and therefore extremely useful to the investigator.

There is generally a large amount of the enzyme AP in human semen, and the amount of AP in a sample of evidence can be determined.

If the amount assayed in a sample of evidence is large enough (there is no consistent agreement as to how much is enough), then it can be said that semen could be present, that is, a finding consistent with the presence of semen.

If you get this result on an oral swab, or from a clothing stain up near the head or shoulders, then you've got a result consistent with oral sex.

Data shows that AP is not unique to semen or prostatic tissue.

In fact, Prostatic AP, the AP found in vaginal secretions, and lysosomal AP are genetically identical.

If this data is correct, then any qualitative AP test is questionable at best.

The qualitative test, like perhaps a polygraph, is a good investigative tool--i.e. it's quick and it points you in a direction.

Not in dispute is the need to get to suspected semen evidence quickly when it's to be collected from the body of a victim.

For example, Schiff[16] reports a case of forced fellatio where both AP tests and Spermatozoa tests were negative only two and a half hours after intercourse (live victim).

This speaks again to the efficiency of the mouth to clean itself and raises again the time issue.

P30- The test for P30, a protein specific to semen, is an immunological assay using anti-P30 antiserum[17].

P30 has not been reported to be found in any other body fluids or organs.

P30 is easily detectable at even the lowest average levels in the semen of the average male, making it an excellent marker when examining very small amounts of trace evidence.

A positive result for P30 is also a strong confirmatory result for semen without the presence of sperm.

This becomes critical given the large number of males in the general population who have undergone vasectomy operations, and who subsequently have ejaculate that contain no sperm whatsoever.

If you get a confirmatory result for P30 antigen then you have semen.

If you get this same result from an oral swab, this is proof positive of oral sex, all without the presence of sperm needing to be confirmed.

There is only one established confirmatory test for semen, that being the immunoassay for P30.

Everything else is presumptive.

The Acid Phosphatase test is presumptive--consistent with the presence of semen, but not proof of semen.

DNA- It is important to note the continuing development of DNA polymorphism tests for individualization of semen[18], as well as research on genetic markers for semen in forensic evidence[1].

This research becomes significant when dealing with very small amounts of suspected semen, or when dealing with mixtures.

In fact, Takatori et al claim that even mixtures such as vaginal secretions and semen do not get in the way of DNase typing, DNase being their seminal marker.

And Blake et al explain about the quantitative tests for PGM, peptidase A, and PGI, all of which have potential for being a genetic marker for semen in one form or another.

However, as Gaensslen[6] points out, these markers are not only found in seminal plasma, but in the victim's secretions as well.

Therefore these markers must be matched against the victim's to determine their true origin. This is not an easy or trivial undertaking. More substantiating research is definitely requisite.

## **SALIVA**

The most common tests for the identification of saliva are dependent upon the detection of amylase.

Since no amylase assay can distinguish between salivary amylase and pancreatic amylase, the tests for saliva identification are all presumptive.

Therefore, if you go into court and say to a jury that you've confirmed the presence of saliva on a vaginal swab or penile swab because it tested positive for amylase, you are misrepresenting your results.

Saliva cannot be confirmed, but amylase can.

Confirmation of amylase means that results are consistent with saliva and perhaps then consistent with oral sex.

Determination of amylase activity is typically done with color change reagents, like a Brentamine Blue or Amylopectin Procion Red.

Preparation of these yes/no qualitative tests is fairly standard [7], [9].

You prepare a starch impregnated paper, dampen the stain or swab, press it against the paper for a moment and then spray the reagent on the paper.

If you get a color change in the spot where you pressed, that's considered positive for amylase activity.

Also reportedly used to determine the presence of saliva is an anti-salivaserum. This immunological assay, however, is dependent again upon the detection of amylase.

Therefore this is still only a presumptive test for saliva.

Presumed saliva in the right place, according to the laws of your particular state, is consistent with oral sex (i.e. vagina, breast, penis, a stain from the front of underpants).

Why is saliva evidence important if you ultimately can't prove you've got any? Firstly, it's good circumstantial evidence, and it adds to the general body of any official statement you make about whether oral sex or some other form of sexual assault occurred.

Secretor status of a suspect can be determined from presumed saliva evidence. This is important for excluding suspects and further focusing investigative search efforts for more likely suspects.

## **Evidence Collection**

Once you've arrived at the evidence, proper collection is the next consideration.

Careless technique can result in the destruction of evidence, such as making a fold on a stain when bagging clothing evidence from a sexual assault or rape; folding dried sperm stains can shatter the sperm and make them unrecognizable to the examiner.

A cooperative effort between all individuals in the chain can make accurate determinations possible.

Cooperation between the investigator, the forensic examiner, the law enforcement community and the medical community are requisite for the best possible results when a sexual assault and/or rape protocol is to be implemented.