

### WHAT IS OOCYTE PICK UP (OPU)?

Oocyte pick-up is a specialized reproductive technique used to collect oocytes (eggs) directly from the mare's ovaries for use in intracytoplasmic sperm injections (ICSI).

### ADVANTAGES OF OPU AND ICSI

OPU and ICSI have some unique advantages compared to other reproductive technologies:

- Enables offspring from sport horse mares, while allowing them to continue in their sport
- Potential to produce multiple embryos from a valuable donor mare in a single breeding season
- Ability to maximize offspring from stallions with very limited amounts of semen
- An advanced fertility option to generate offspring from mares with reproductive pathology or of advanced age that are not able to produce offspring through other methods.

### PREPARING FOR THE PROCEDURE

Prior to the procedure, the mare should be examined by ultrasound to ensure she is cycling and ovarian follicles are developing. **The night before the procedure, the mare should be held off feed.**

### OOCYTE PICK UP PROCEDURE

- **Preparation:** Prior to the procedure, the mare is sedated and given pain medication and a dose of antibiotics. Her perineal area is cleaned to minimize risk of infection.
- **Ultrasound Guidance:** A specialized ultrasound probe is introduced into the vagina and used to visualize the ovaries and their follicles.
- **Oocyte Retrieval:** A specialized aspiration needle, guided by the ultrasound probe, is inserted through the vaginal wall into the ovary. The needle is inserted into each follicle and the follicle is flushed with sterile fluid and suctioned simultaneously to collect the oocyte from inside the follicle.
- **Oocyte Processing:** The aspirated fluid is searched under the microscope to identify and isolate oocytes. The oocytes are transferred into a specialized media and transported to the ICSI lab.

### WHAT COMES NEXT?

Following the OPU procedure, the collected oocytes are sent to the ICSI lab. At the lab, the oocytes are matured, and then each oocyte that successfully matures is injected with a single sperm cell. Fresh or frozen semen can be used for this process. Following injection, the oocytes are incubated and closely monitored to assess for development into an embryo. Embryos can be shipped back to the clinic to be transferred if a recipient mare is ready, or can be frozen and stored for future use.

We are proud to be working with ViaGen, located in Lethbridge, AB. Viagen is the first ICSI lab in Canada and is leading the way with this specialized technology.

### REPORTED SUCCESS RATES

A wide variation exists in the number of embryos generated from a single OPU session because there are many factors that can affect success. A general estimate is provided below:

- 1) **Oocyte Retrieval Rate:** On average, an OPU procedure yields between 5-15 oocytes from a healthy mare. This number can vary based on the mare's age, health, and reproductive status.
- 2) **Maturation and Quality of Oocytes:** Of the oocytes retrieved, a portion may not mature or be of low quality and not suitable for sperm injection. Typically, 60-80% of oocytes are suitable for ICSI.
- 3) **Fertilization Success with ICSI:** The success rate of ICSI generally falls around 50%, but varies depending on oocyte quality, semen quality and lab conditions.
- 4) **Development to Viable Embryos:** Of those oocytes that successfully fertilize, around 30-60% continue to grow and develop into variable embryos suitable for transfer or freezing.

## FACTORS AFFECTING SUCCESS RATES

- **Mare's Age and Reproductive Health:** Younger, healthier mares generally produce more and better-quality oocytes.
- **Sperm Quality:** The fertility of the stallion or the quality of frozen semen used for ICSI can impact success rates. But usually to a lesser extent than the quality of the oocyte.
- **Laboratory Conditions:** The expertise of the laboratory personnel and the quality of the culture environment play crucial roles.
- **Procedure Frequency:** The number of times a mare undergoes OPU can affect ovarian health and subsequent yields.
- **Individual Variation:** Each mare is an individual and may have higher or lower success than these provided averages. Some mares consistently yield higher numbers of viable embryos, while some yield fewer.

## AFTERCARE FOLLOWING THE PROCEDURE

After the procedure, we recommend the mare be rested for 2 days before returning to work. The mare should be monitored for any signs of procedure related complications. If anything of concern is noted, seek veterinary advice.

## POTENTIAL RISKS/COMPLICATIONS

As with all invasive procedures, there are potential risks associated with the OPU procedure. The risks of complications should be considered when deciding if OPU is right for your mare.

Risks at the time of procedure:

- **Stress and Discomfort:** The procedure can be stressful and uncomfortable for the mare. To mitigate this, sedation and pain medication are given prior to the start of the procedure.
- **Anesthetic Risk:** Sedation is used to keep the mare calm and quiet during the procedure. Any time sedatives are used, adverse reactions to the sedatives, including respiratory and cardiovascular complication, can occur.
- **Hemorrhage:** Localized hemorrhage (bleeding) is expected to occur when the needle is inserted into the ovarian tissue. However, there is a small risk of more significant hemorrhage which may require additional veterinary intervention to manage.
- **Infection:** While the OPU procedure is carried out using sterile technique, there is always a small risk of introducing infection during the procedure. Infection can occur in the ovary, or systemically which could have consequences for the mare's health and fertility.

Potential longer term complications:

- **Ovarian trauma and scarring:** from the needle used for aspiration can cause inflammation and tissue damage to the ovary. This can lead to scarring of the ovary, which may potentially cause impaired ovarian function and decreased fertility over time.
- **Adhesions:** Similarly, trauma caused by the needle for aspiration can lead to formation of adhesions (bands of scar tissue) between the ovary and surrounding tissues. Adhesions can cause pain, restrict ovarian movement, and complicate future OPU attempts or other reproductive procedures.

## CONCLUSION

Overall, equine OPU is a sophisticated and effective method for advancing equine reproductive management and improving genetic selection. While equine OPU is a valuable tool, there are risks associated with the nature of the technique that should be considered. Success rates can vary greatly.



## Oocyte Pick Up Procedure



### ESTIMATED COSTS OF OPU WITH FEN VET REPRO

OPU PROCEDURE AT FEN VET EQUINE REPRODUCTION	
Mare Board	\$38/day ( Dry mare outdoor)
OPU Procedure, Processing of Oocytes, Pharmaceuticals and Supplies	\$1850
Oocyte Shipping to Viagen Lab	Courier Fees Billed at Cost
Mare Aftercare and Pharmaceuticals	Case dependent
VIAGEN LABORATORY COSTS (Note: Prices are subject to change)	
Oocyte Processing and Maturation Fee (Charged if no oocytes suitable to inject)	\$550
ICSI Procedure on Received Oocytes With Non-Sorted Semen	\$925 Immature oocytes Additional \$475 each for fertilization from multiple stallions
ICSI Procedure on Received Oocytes With Sex-Sorted Semen	\$1375 per batch of oocytes Additional \$475 each for fertilization from multiple stallions
Each Mature Embryo Produced	\$1,000 per embryo
Each Embryo Frozen	\$400 per embryo
Embryo Biopsy (Optional)	\$925 per embryo
Processing Ovaries and ICSI on Recovered Oocytes (Note: this applies when entire ovaries are shipped such as in salvage procedures when a mare unexpectedly passes away)	\$1600 for ovary processing fee Additional \$475 each for fertilization from multiple stallions
EMBRYO TRANSFER AT FEN VET EQUINE REPRODUCTION	
Embryo Thawing and Handling for Transfer	\$170 per embryo
Embryo Transfer Procedure	\$585 per embryo
Pharmaceuticals for Mare During and Post Transfer	Case dependent
Embryo Recipient Synchronization	Services billed on individual basis
Frozen Embryo Storage (Per Year) Note: Storage fees start January of 2027 if embryos not used before	\$115 per embryo per year