

Embryo Transfer as an Integral Part of Today's Equine Practice

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Introduction

The field of equine assisted-reproductive technology is becoming big business. While embryo transfer (ET) is only one of these techniques, it is perhaps the most rapidly growing service available to equine breeders today. Growth of the ET business may be attributed to many factors. Among them are well-educated horse owners with access to all of the current research and innovative procedures. As equine practitioners, we now find ourselves presented not only with new opportunities but with an increasing and ever present obligation to practice high quality medicine. At the same time, we must consider the long-term welfare of our patients. Because ET is an elective procedure on a healthy mare, we must remember above all else – do no harm.

As it would be easy to spend a few days on the subject of embryo transfer, I hardly know where to begin. Therefore, I will start with the approach our practice has taken.

Consider the Demand for Embryo Transfer

Today's equine breeder has become very fond of successful embryo transfer. Mares that are considered candidates include: show mares, valuable mares of all ages, the possibility of multiple embryos, aged mares and mares with musculoskeletal problems. The demand is extensive. However, the keyword is successful. I find that breeders quickly become discouraged and disillusioned with unsuccessful attempts.

Define Success

The practitioner needs to constantly evaluate their technique both with honest criticism and questions as to what could be done better. It is my feeling that the following conditions are true.

If :

- 1) the donor mare's uterus is managed properly,
- 2) she is bred at the appropriate time and ovulates and
- 3) the oviduct is patent and functional...

...then one should recover embryos with at least the same rate as the per cycle conception rate of the stallion.

In addition, when one viable embryo can be successfully transferred into a suitable recipient, it follows that all viable embryos could be successfully transferred if one's technique is good enough. If I transfer a viable embryo and it does not grow, then I consider it my fault. I may have damaged the embryo in the transfer process or selected a less than adequate recipient.

Table 1.0 2003 Breeding Season (Feb 15-June 30)

Farm	# of Flushes	<u>Transferred on Farm</u>			Sent to a Commercial Facility
		Embryos Recovered	14 Days	30 Days	
D	23	14	13/14	13/14	
Re	73	57	52/57	50/57	
S	79	60	56/60	52/60	
P	37	29	3/3	3/3	?/26
K	33	25	21/25	21/25	
R	104	69	16/19	14/19	?/50
T	62	27	?	?	
Misc.	37	21	?	?	
Totals	448	302	161/178	153/178	?/76
			90.14%	85.90%	

Practitioner Expense and/or Income From Recipients

The expense that the practitioner incurs will depend on the approach taken regarding recipients. Several possibilities exist. Among them are:

- 1) Practitioner maintains a herd of recipients at their own expense.
- 2) Send recovered embryos to a commercial facility.
- 3) Maintain a recipient herd on the farm at the farm's expense.

Practitioner Expense for Each Flush

This topic undoubtedly varies tremendously among practitioners. A few years ago, I made the decision to use only new supplies for each flush. At first, this sounds absurd. However, I was spending \$200.00 per day on a de-ionized water system, not to mention the expense of labor for washing and rinsing. The following table shows the typical cost for one flush.

Table 2.0 ET Flush Expense

Supply	Cost
1 Em Con Filter ^a	\$9.25
Rusch Catheter ^b , 28Fr. 75ml	\$20.00
Long Y Foley Large Bore Spike ^c	\$4.95
Flush Sol. (Complete Ultra ^d)	Average Flush \$50.00 (\$19.25/2L bag)
Search Dish with grid	\$0.75
Wash Dish	\$0.75
2 Pkgs. Straws (1/4cc or 1/2cc)	\$1.75
1 Air Tite Syringe ^e	\$0.65
Side Delivery, metal tip sheath	\$2.75
Pipette Guard	\$0.40
Sedation (donor &/or recipient)	\$8.75
Total	\$100.00

Note that by washing and re-using the filter, catheters and long Y, the potential savings is \$34.20. This does not take into account your costs for labor and de-ionized water.

There is somewhat of a paradox regarding successful ET and income. If one charges on a per flush basis, then success results in fewer charges. However, long-term success will bring increased numbers of ET's and thereby increased revenue.

Technique – Potential Problems

There appear to be as many different approaches to ET as there are people doing the procedure. However, I feel that there are certain potential problem areas within the technique worthy of discussion.

- 1) Failure to properly prepare the donor mare's uterus prior to insemination and maintain the uterus for the duration of estrus. Endometritis and the presence of bacteria or other microbes in the flush greatly reduce the rate of embryo survival.
- 2) Improper timing estimate of conception by the examiner.
- 3) Failure to fill both uterine horns with flush solution. This is especially a problem with wet mares.
- 4) Failure to place the end of the catheter in each uterine horn for the emptying of at least one of the flushes.
- 5) Failure to adequately wash the embryo at the end of the flush.
- 6) Intentionally timing flushes so that the embryo will be large enough to see in the filter and thus using less flush solution.
- 7) With regard to non-surgical ET, failure to prevent damage to the embryo as it exits the device used in the transfer process.

- 8) Remember the possibility that the embryo will not completely exit or detach from the ET gun or pipette.
- 9) Failure to properly prepare the recipient.
- 10) The administration of medication to the recipient may be of benefit.

Disturbing Trends

With the increase in demand for ET, we are seeing a lot of farms and individuals pursuing financial gain in the ET business. This becomes a problem when costs are cut to the point of interfering with proper technique. In addition, there are an increasing number of non-veterinary personnel that are entering the market and offering ET service at comparatively low fees.

One final thought. As we see different breed associations approve the registry of multiple embryos, we need to be cautious of doing “too much” to certain donor mares. Some of the greatest mares may well be ruined reproductively at a relatively young age if we are not careful.

^aEm Con Filter, Immuno Systems, Inc., 219 McKay Avenue, Spring Valley, WI 54767

^bRusch Catheter, Rusch, Inc., 2450 Meadowbrook Parkway, Duluth, GA 30096

^cLong Y Foley Large Bore Spike, MAI Genesis, 111 Central Street, Spring Valley, WI 54767

^dComplete Ultra, ICPbio Limited, 26 Waipareira Avenue, Henderson, Auckland, New Zealand

^eAir Tite Syringe, Henke-Sass, Wolf GMBH, Kronenstrabe 16, D-78532, Tuttlingen/Germany