



Quality of Four Transport Systems for Bacterial Survival

J.M. Rousée, H. Monteil and Y. Piémont,

Institut de Bactériologie, Université de Médecine Louis-Pasteur de Strasbourg, Hopitaux Universitaires de Strasbourg

ABSTRACT

Objectives: To evaluate 3 Amies charcoal-free swab transport systems: Venturi Transystem® (Copan Diagnostics Inc., Italy) (COP), Transwab® (Medical Wire & Equipment Co., UK) (TWB), Eurotubo® (IASA, Spain) (EUR) and a capped syringe (SYR).

Methods: One ATCC stain and one freshly obtained clinical isolate (IBS) for each tested species. *Haemophilus influenzae* ATCC 10211 and IBS00G127, *Neisseria gonorrhoeae* ATCC 43069 and IBS99V001, *Eikenella corrodens* ATCC 23834 and IBS98B8237, *Bacteroides fragilis* ATCC 25285 and IBS00B001, *Fusobacterium nucleatum* ATCC 25586 and IBS00B002, *Peptostreptococcus anaerobius* ATCC 27337 and IBS00V002.

Swabs were inoculated with 100µl of a 1:10 saline dilution of a 0.5 McFarland bacterial suspension. Syringes contained 1 ml of this diluted suspension. After room temperature incubation (0, 6, 24 and 48 hours), swabs were discharged in saline (30 seconds) and colony forming units counts were performed on appropriate agar plates.

Results: Survival differed according to each transport system and each strain. At 6 h, recovery rates ranged between 9.8% for *Neisseria gonorrhoeae* ATCC 43069 and 98.5% for *Haemophilus influenzae* IBS00G127 with COP, between 6.7% for *Neisseria gonorrhoeae* ATCC 43069 and 105.7% for *Bacteroides fragilis* IBS00B001 with TWB, between 0.04% for *Peptostreptococcus anaerobius* ATCC 27337 and 107.9% for *Bacteroides fragilis* ATCC 25285 with EUR and between 0% and 39.7% for *Eikenella corrodens* ATCC 23834 with SYR. There was a dramatic reduction of survival after 24 and 48 h incubation. The best recovery rate was 35.5% with TWB and 27.6% with COP for *Bacteroides fragilis* IBS00B001 at 24h.

Conclusions: Copan® and Transwab® had the best recovery rates and always require prompt transport of clinical specimens to the laboratory.

OBJECTIVES

To evaluate the survival of fastidious and anaerobic bacteria in one hand in three european commercial Amies charcoal-free swab transport systems and in the other hand in a capped syringe.

Maintaining bacteria viability during specimens transport is an extremely important step for bacterial analysis, particularly for fastidious and anaerobic bacteria.

The time necessary from collection to cultivation can represent several hours. Therefore specimen transport requires a transport medium. Transport system must be able to inhibit oxidation and dehydration during transport. Moreover, the system should not contain or develop any toxic product.

MATERIALS

1. Strains: 12

	ATCC Number	Clinical Isolates
<i>Haemophilus influenzae</i>	10211	IBS 00G127
<i>Neisseria gonorrhoeae</i>	43069	IBS 99V881
<i>Eikenella corrodens</i>	23834	IBS 99B8237
<i>Bacteroides fragilis</i>	25285	IBS 00B001
<i>Fusobacterium nucleatum</i>	25586	IBS 00B002
<i>Peptostreptococcus anaerobius</i>	27337	IBS 00V002

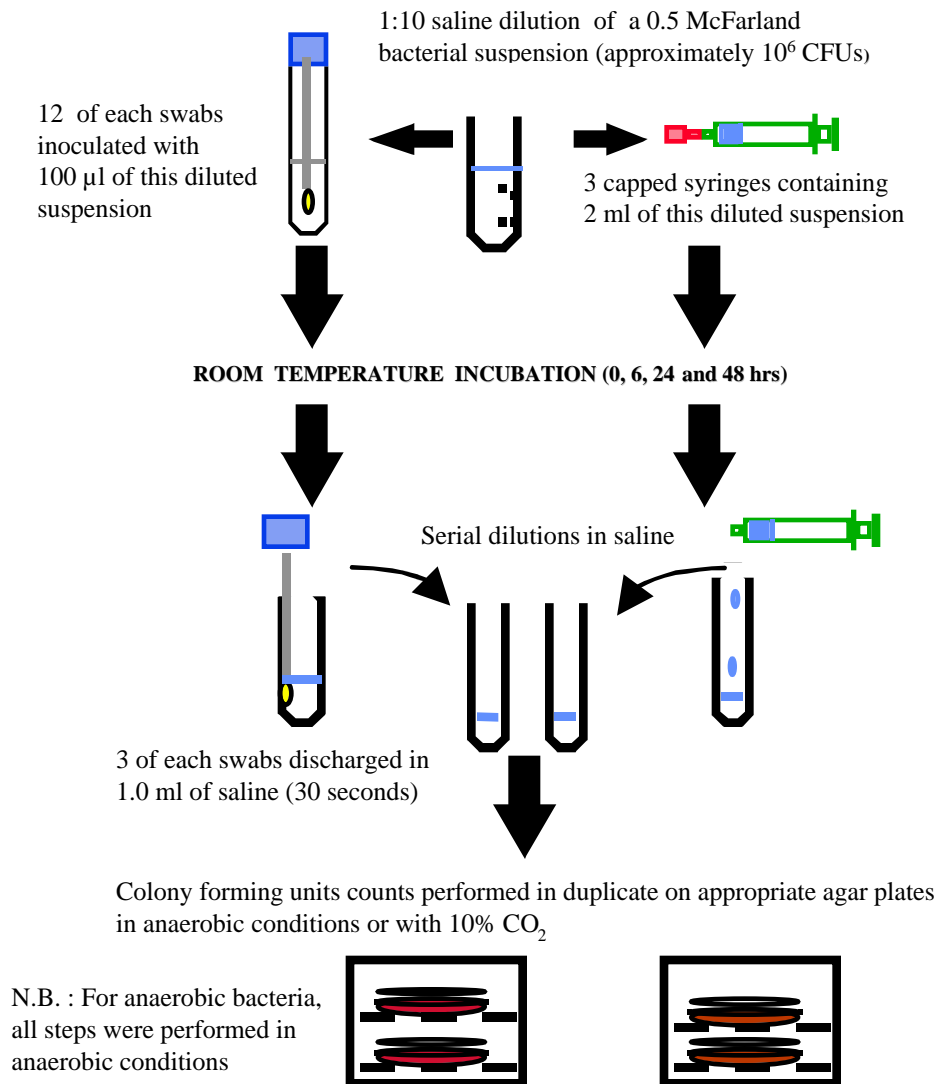
2. Transport media: 4

- 3 Amies charcoal-free swab transport systems:
 - Venturi Transystem® (Copan Diagnostics), Transwab® (Medical Wire & Equipment)
 - Eurotubo® (IASA, Spain)
- A capped syringe

3. Agar Plates for performance analysis:

Agar plates	Incubation (37°C)
Chocolate Agar Enriched (Biolife Milano, Italy)	10% CO ₂
Schaedler Blood Agar (Biolife Milano, Italy)	anaerobic conditions

METHOD



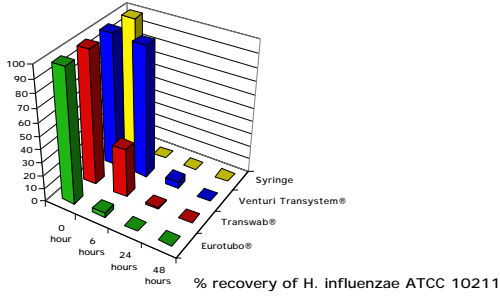
RESULTS

See over-leaf

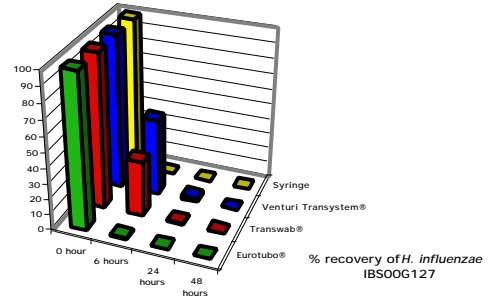
CONCLUSIONS

- Venturi Transystem® and Transwab® had the best recovery rates.
- Syringe was not a good transport system in these experimental conditions.
- Contribution of organic substances for bacterial protection in clinical samples remains to be determined.
- Recovery rates were acceptable at 6 hours for tested strains with the best transport systems.
- Over 6 hours, there was a dramatic reduction of survival for the 12 strains even with the best transport system.
- The quantitative performances of all transport systems should be assessed.

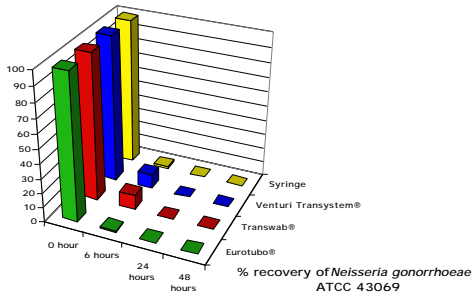
RESULTS (1 of 2)



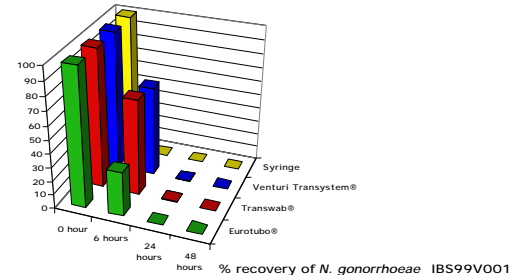
	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	3,375	0	0
■ Transwab®	100	36,4	0,9	0
■ Venturi Transsystem®	100	98,5	5,3	0,04
■ Syringe	100	0,03	0	0



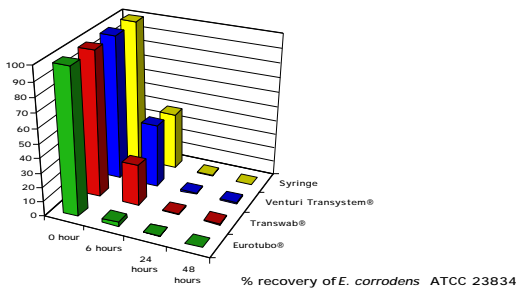
	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	0,93	0	0
■ Transwab®	100	36,4	0,76	0
■ Venturi Transsystem®	100	50,1	2,6	0,04
■ Syringe	100	0	0	0



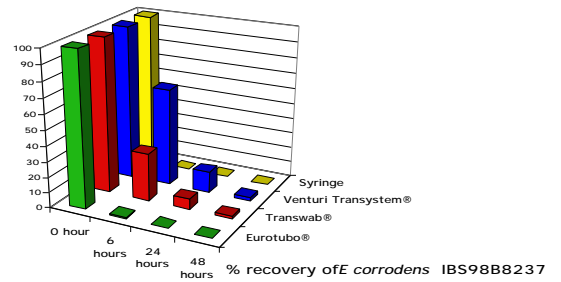
	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	0,94	0	0
■ Transwab®	100	10,1	0,06	0
■ Venturi Transsystem®	100	9,78	0	0
■ Syringe	100	1,2	0	0



	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	32,4	0	0
■ Transwab®	100	69,5	0,34	0
■ Venturi Transsystem®	100	64,9	0,23	0
■ Syringe	100	0	0	0

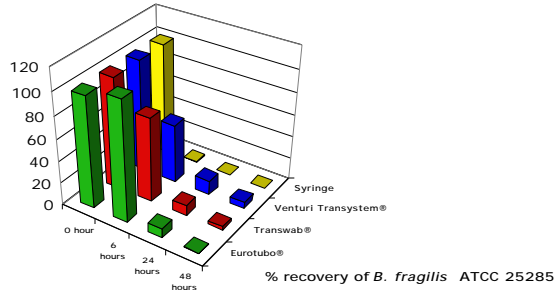


	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	2,6	0,15	0
■ Transwab®	100	28,7	0,63	0,53
■ Venturi Transsystem®	100	43,7	0,77	0,77
■ Syringe	100	39,7	0,54	0

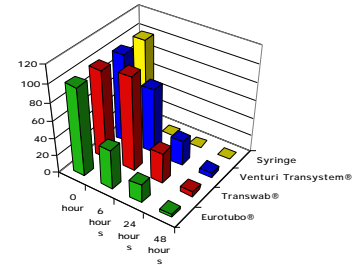


	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	0,57	0,01	0
■ Transwab®	100	31,1	6,8	1,6
■ Venturi Transsystem®	100	63,6	13,7	2
■ Syringe	100	0	0	0

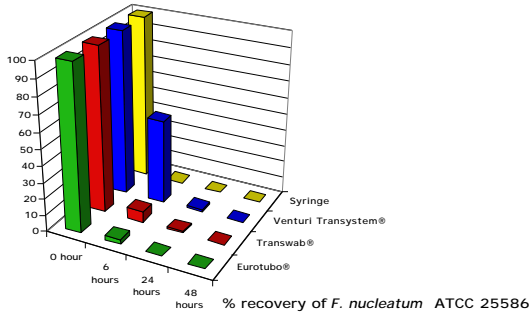
RESULTS (2 of 2)



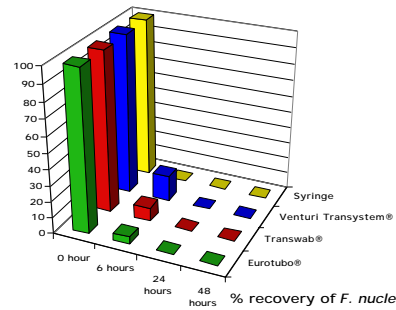
	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	107,9	8,2	0,66
■ Transwab®	100	75,9	9,1	3,2
■ Venturi Transystem®	100	52,6	13	5,9
■ Syringe	100	0,76	0,02	0



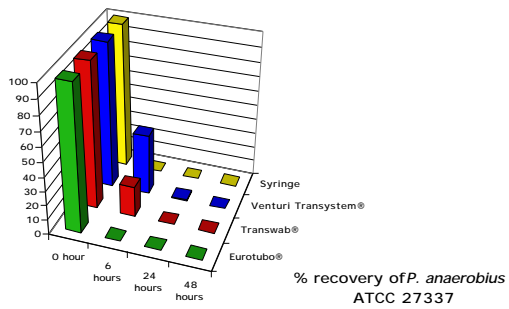
	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	45,3	21	3,5
■ Transwab®	100	105,7	35,5	6,3
■ Venturi Transystem®	100	74	27,6	5,4
■ Syringe	100	0,5	0	0



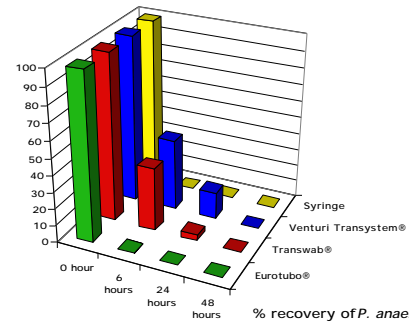
	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	3	0	0
■ Transwab®	100	6,7	0,96	0,01
■ Venturi Transystem®	100	5,1	1,61	0
■ Syringe	100	0	0	0



	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	4,4	0	0
■ Transwab®	100	8,6	0,1	0
■ Venturi Transystem®	100	16	0,2	0
■ Syringe	100	0	0	0



	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	0,04	0	0
■ Transwab®	100	20,8	0,02	0
■ Venturi Transystem®	100	41,3	0,7	0,02
■ Syringe	100	0	0	0



	0 hour	6 hours	24 hours	48 hours
■ Eurotubo®	100	0,21	0	0
■ Transwab®	100	38	3,8	0
■ Venturi Transystem®	100	42,7	16,1	0
■ Syringe	100	0	0	0