Transition from Transystem to Liquid Based Microbiology (ESwab™) specimen's collection devices for WASP™ and WASPLab™ clinical specimens processing.

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INTRODUCTION:

Copan Transystem (TS) consists of a plastic tube with Amie's agar-gel or a sponge with liquid Amies and has been the traditional specimen collection device for bacteria culture. Copan associated the invention of FLOQswab™ to the development of the Liquid Based Microbiology (LBM) concept. ESwab™ (ES) is an LBM device for the collection of clinical specimens for bacterial culture and consists of a 1 ml tube of liquid Amies and flocked swabs. The LBM concept was developed to enable automated bacteriology specimens processing. The transition from Transystem to ESwab™ with WASP™ automation requires appropriate validation since different inoculation methods are required: Transystem by direct swabbing, ESwab™ by volumetric system.

OBJECTIVES:

The objectives of this study were to:
- Quantitatively evaluate the volume of ES that corresponds to Transystem swabbing for bacteria culture inoculation.
- Qualitatively compare cultured plates and Gram-smears of ESwab™ spiked clinical specimens processed by WASP™ versus Transystem manually processed.

METHODS & MATERIALS :

1) ESwabs™ and Transystems were spiked with 100uL of a freshly prepared countable suspension of *E. coli*, *S. aureus*, *C. albicans* and *P. aeruginosa* strains. Transystem were seeded with manual swabbing on the first quadrant of blood agar plates while ESwab™ was loaded on WASP™ and seeded on blood agar plates with 30ul loop and 5QT1 streaking-pattern. After plate incubation in WASPlab™, numbers of colonies were counted.

2) ATCC strains were used to spike throat, nasal and vaginal swabs specimens collected with ESwab™ and Transystem from volunteers. Vaginal samples were spiked with 10uL each (10^7 CFU/ml) of *E.coli and* (10^9 CFU/ml) of *C. albicans.* Nasal and throat samples were respectively spiked with 10uL (10^7 CFU/ml) of *S. aureus,* and *S. pyogenes.* All Transystems were seeded manually, swabbing the first quadrant of agar plates and preparing the gram smear, while all ESwab™ were loaded on WASP™ using 30ul loop for smear preparation and for seeding appropriate agar plates with a 5QT1 streaking pattern. All plates were transferred to WASPLab™ and incubated at appropriate conditions. Plate were recorded after 24h and interpreted.

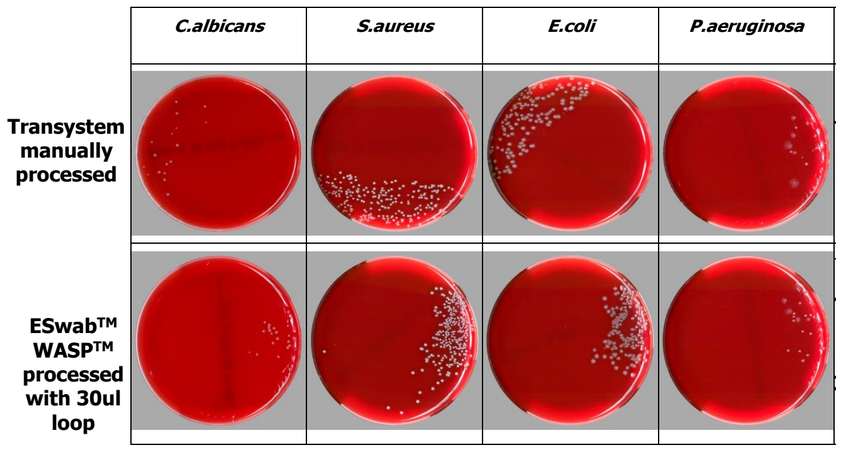
MATERIALS:

RESULTS:

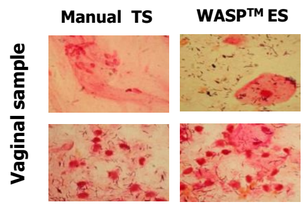
In the quantitative analysis the CFUs obtained from ESwab™ streaking by WASP™ were comparable to manual Transystem.
In the qualitative analysis, ESwab™ samples plated by WASP™ had the same results as manual Transystem.

	P. aeruginosa		*E. coli*		*S. aureus*		*C. albicans*	
	MST	WSE	MST	WSE	MST	WSE	MST	WSE
Plate 1	12	17	67	83	102	126	15	24
Plate 2	14	15	74	99	96	97	17	19
Plate 3	15	13	72	91	120	122	24	25
average	**13.6**	**15**	**71**	**91**	**106**	**115**	**18.6**	**22.66**

Table 2: Results of colony counting in **MST** (manual streaked Transystem) and **WST** (WASP streaked ESwab)

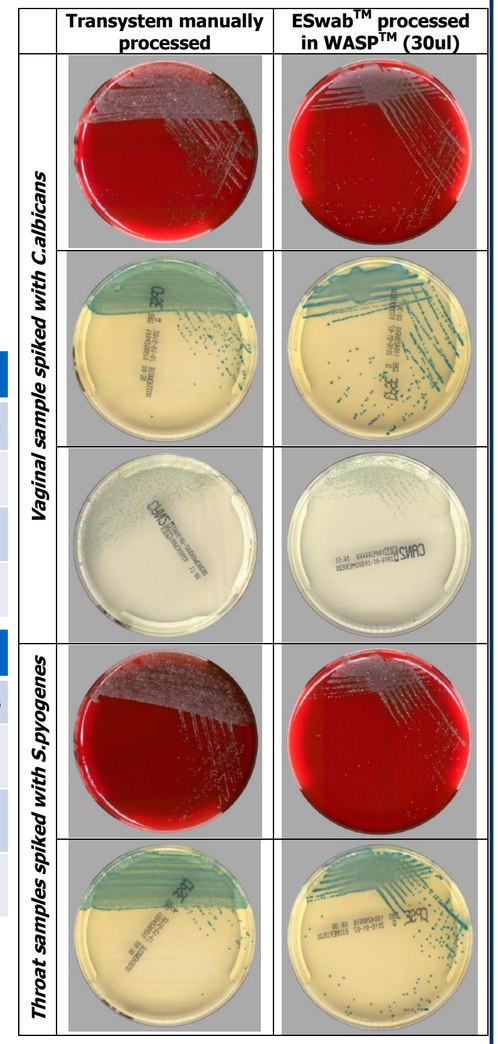


In the qualitative analysis, ESwab™ samples plated by WASP™ had the same results as manual Transystem.
ESwab™ WASP streaked plates had more isolated colonies than manual Transystem. The WASP™ prepared Gram-smears slides were well distributed and stained with more elements than the Transystem.



Transystem vs ESwab: plate inoculation	
Diagnostic interpretation agreement	100%
Few and not significant colonies were present on ES WASP™ streaked blood agar plates but do not present on TS plates	3%
Few and not significant colonies were present on TS blood agar plates but do not present on ES WASP™ streaked plates	1%
More isolated colonies were present on ES WASP™ streaked agar plate in comparison to TS streaked plates	30%

Transystem vs ESwab: Slide Preparation	
Diagnostic interpretation agreement	100%
TS manual prepared Gram stained smears were non homogeneous and poorly stained in comparison to ES WASP™ prepared smears	2%
ES WASP™ prepared Gram stained smears were homogeneous and well stained in comparison to TS manual prepared smears.	1%
ES WASP™ prepared Gram stained smears had more elements in comparison to TS manual prepared smears.	5%



CONCLUSIONS:

The quantitative data obtained demonstrated that 30ul ESwab™ sample is the optimal volume to use with WASP™ in comparison to manual Transystem.
The qualitative data obtained from ESwab™ plates and Gram-smears processed by WASP™ automation had same results outcome than Transystem, but ESwab™ WASP™ processed samples had better colonies quality and distribution and Gram stained smears.

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