

Using APAS® Independence for Automated Imaging and Assessment of Urine Culture Plates

Steven Giglio*, Michael Summerford, Rhys Hill.
LBT Innovations, 300 Flinders Street, Adelaide, SA 500



APAS® Independence is a medical device that **images and interprets** microbiological cultures after incubation.

Interpretation of cultures is based on the ability to distinguish specific organism groups and morphologies that input into an expert rule system based on international reporting guidelines. The device is able to then designate those plates that are “positive” or “review” which have a high probability of being significant and require microbiologist intervention, and those that are “negative” and can be triaged out of the workflow. Given that up to 70% of urine cultures are negative, skilled microbiologists can appropriately use their time on those samples that require further work only.

A pivotal pilot study was performed in Australian Laboratories using 2,163 urine samples¹

In this first clinical evaluation, APAS demonstrated high performance in the detection, enumeration, and colony classification of isolates compared with that for conventional plate-reading methods.

The device found all cases reported by the laboratory and detected the most commonly encountered organisms found in urinary tract infections

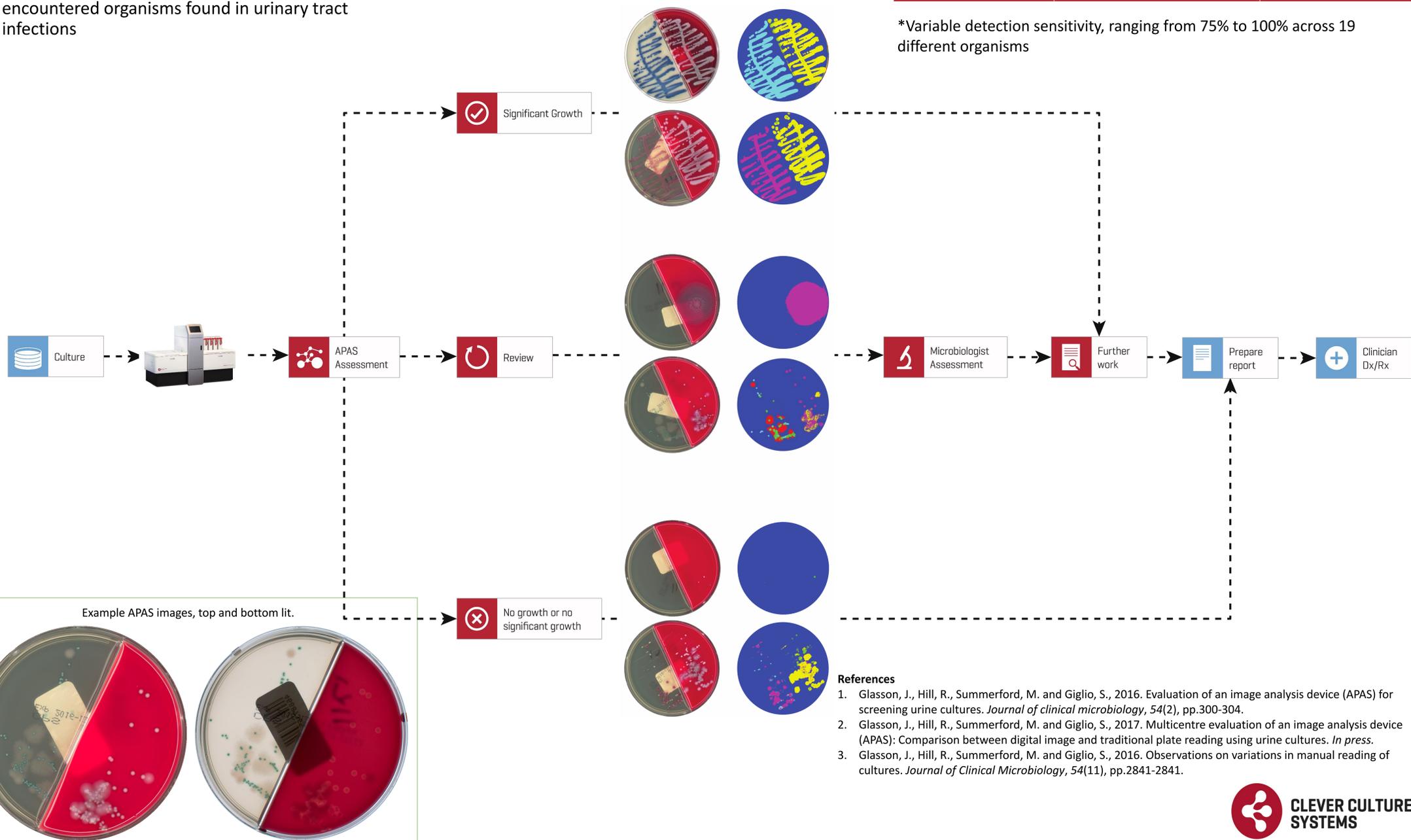
A multi-centre pilot study was performed in Australian and US Laboratories using 9,224 urine samples²

Diagnostic sensitivity of 99.0%, specificity of 83.5%. Specificity influenced by using humans as a reference/truth, where inherently, variations occur between microbiologists³

Colony detection sensitivity (Blood Agar) = 99.0%
Colony detection sensitivity (MacConkey CV) = 99.5%

Organism	APAS detection sensitivity (%)	N of isolates
<i>E. coli</i>	99.5	1536
<i>K. pneumoniae</i>	100	210
<i>E. faecalis</i>	100	164
<i>S. agalactiae</i>	98.6	142
<i>P. aeruginosa</i>	100	87
<i>P. mirabilis</i>	100	74
CNS	98.1	52
<i>S. aureus</i>	100	34
<i>E. cloacae complex</i>	100	29
<i>S. saprophyticus</i>	100	28
<i>C. freundii</i>	100	28
<i>Aerococcus spp.</i>	100	27
<i>C. koseri</i>	100	19
<i>E. aerogenes</i>	100	22
Others	*	153

*Variable detection sensitivity, ranging from 75% to 100% across 19 different organisms



References

1. Glasson, J., Hill, R., Summerford, M. and Giglio, S., 2016. Evaluation of an image analysis device (APAS) for screening urine cultures. *Journal of clinical microbiology*, 54(2), pp.300-304.
2. Glasson, J., Hill, R., Summerford, M. and Giglio, S., 2017. Multicentre evaluation of an image analysis device (APAS): Comparison between digital image and traditional plate reading using urine cultures. *In press*.
3. Glasson, J., Hill, R., Summerford, M. and Giglio, S., 2016. Observations on variations in manual reading of cultures. *Journal of Clinical Microbiology*, 54(11), pp.2841-2841.