INTRODUCTION
Numerous sources in the clinical microbiology literature suggest that anaerobic cultures should be incubated for 5 days prior to issuing a final no growth result. However, little data exist to support this recommendation. In fact, a Quality Assurance (QA) study was performed in 1992 by one of the current investigators (MPW) which evaluated the cost-effectiveness of routine anaerobic cultures at Robert Wood Johnson University Hospital (RWJUH) and assessed whether incubating specimens for 5 days rather than 2 days improved the diagnostic yield. Twenty of 938 specimens (2.1%) grew anaerobes; only 1 specimen (judged to be a contaminant) grew at 5 days but not at 2 days. It was concluded that anaerobic cultures do not need to be incubated longer than 2 days. Since that time, the protocol in the RWJUH Microbiology Laboratory has been to report anaerobic culture results after a 2 day incubation period.

We have now repeated this analysis using contemporary reagents and systems for generating anaerobic environments to reevaluate the relative yield of anaerobes after 2 days of incubation versus 5 days of incubation. In addition, we assessed the overall yield of anaerobic cultures according to specimen source and the effect of duration of incubation of anaerobic cultures on yield and patient management.

METHODS
We performed an 8 mo. prospective QA study between August 1, 2013, and March 31, 2014. All specimens submitted for anaerobic cultures at RWJUH during this time were included in the study. These included specimens from sterile body fluids (except joint tissue/fluid or peritoneal dialysate effluent) wounds, tissues, abscesses, aspirates and operative specimens which were inoculated to appropriate media, and placed into chambers with anaerobic atmosphere. Each culture was then incubated for 48 h before and then examined according to the normal laboratory protocol. Cultures that showed no growth after 48 h were re-incubated for an additional 3 days and then re-examined at after 5 total days of incubation. Chart review was performed on anaerobic cultures that were positive only after 5 days to determine the clinical significance of the positive result.

RESULTS
- 2,107 specimens were processed for anaerobes.
- 177 (8.3%) grew anaerobes.
- Only 2 (1.2%) grew at 5 days and not at 2 days.
- 175/177 (98.8 %) anaerobes were detected after 2 d of incubation.
- Propionibacterium acnes was isolated from the 2 specimens that grew only after 5 d.
- One of the 2 P. acnes, which grew from brain tissue, was judged to be clinically important, and patient management was altered based on the positive culture results.
- Thus, 1 of 177 clinically important anaerobic cultures (0.6%) would have been missed with our present 2 d incubation protocol

CONCLUSIONS
- Study results confirm observations from 2 decades ago.
- The majority of anaerobic cultures show growth within 2 d of incubation.
- Rarely longer incubation (e.g., 5 d) is needed, particularly for P. acnes.
- During and after this study, 3 additional clinically important P. acnes were isolated with prolonged incubation (based on physician request) on days 7,11 and 12.
- Physicians should be aware of incubation protocols in their Microbiology laboratories and, if 2 d incubation periods are used, may wish to request extended incubation when clinically indicated (e.g., presence of CNS or orthopedic hardware).
- Good communication between clinicians and the Microbiology Lab is essential to ensure adequate incubation periods for such specimens.
- In an era of cost containment, in-house quality assurance studies can enhance cost effective microbiology and patient care.

REFERENCES: