Synthetic swabs (rayon and Dacron) are used to collect specimens for bacterial culture in preference to cotton swabs which may contain inhibitory or toxic substances. Regan-Lowe medium has been traditionally recommended for Bordetella transport. Little work has been done to determine the performance and suitability of synthetic fiber swabs used in conjunction with Amies charcoal transport medium (TM) for the maintenance of Bordetella pertussis. Suspensions from 20 fresh isolates of Bordetella pertussis were adsorbed onto rayon and Dacron tipped swabs and placed in Amies charcoal TM (Copan Italia, Brescia, Italy) and stored at room temperature. Swabs from Amies TM were plated to Regan-Lowe medium at 0, 24, 48, 72 and 96 hours. Recovery of organisms from each swab type was quantified using a plate count technique. The recovery from triplicate platings of each swab type was equivalent. Average plate counts dropped with each extra day of storage in TM. At 96 hours the counts from the rayon and Dacron swabs were 13.8% and 9.3% respectively of the 0 hours counts. We conclude that either rayon or Dacron is a suitable swab material for pertussis cultures.

**METHODS**

- Using a BBL® Prompt™ inoculation wand, growth was harvested from a fresh subculture (five days incubation) of Bordetella pertussis grown on Regan-Lowe agar without antibiotics.
- The inoculum was suspended in the BBL® Prompt™ tube of 0.85% saline.
- Two further dilutions were made in 0.85% saline:
  - 1:1,000 used to inoculate swabs to be tested
  - 1:50,000 used to determine the organism load applied to the swabs

**SPREAD PLATE TECHNIQUE**

- 0.1 mL was applied to the surface of a Regan-Lowe agar plate.
- The inoculum was spread using a sterile bent wire (“hockey stick”) spreader.
- The surface of the plates was allowed to absorb inoculum and dry for 15 minutes.
- All plates were incubated inverted in a humidified incubator at 35°C for 7 days.
- The number of colonies per plate were counted manually using a Quebec colony counter.

**TO DETERMINE ORGANISM LOAD**

- Triplicate plate counts were performed at zero time for each culture used in the study.
- 0.1 mL from the 1:50,000 dilution was applied to the Regan-Lowe agar.
- After 7 days incubation, colonies were counted.
- Average plate count x50 = no. of organisms delivered to swabs.

**SWAB COMPARISON FOR 20 FRESH CLINICAL ISOLATES OF Bordetella pertussis**

- For each isolate 15 Copan rayon tipped swabs and 15 Copan Dacron tipped swabs were used.
- 0.1 mL of the 1:1,000 dilution was pipetted into a sterile 12x50 tube.
- The appropriate swab was placed into the tube and allowed to adsorb the suspension.
- After adsorption, the swab was placed into the Venturi Transystem™ Amies transport tube.
- Triplicate platings of each swab type were performed at 0, 24, 48, 72 & 96 hours.
- The swab from the transport medium was streaked evenly in three directions onto the surface of the Regan-Lowe medium to obtain a uniform inoculum.
- The transport tubes were stored at room temperature pending plating.
- All Regan-Lowe plates were incubated for seven days @ 35°C.
- The triplicate counts from each swab type were averaged.

**COMPARISON WITH REGAN-LOWE TRANSPORT MEDIUM**

- Two cultures were also set up in Regan-Lowe transport medium.
## DISCUSSION AND CONCLUSIONS

- Less than 3% of the initial inoculum was recoverable from swabs in TM. The remainder of the inoculum was adsorbed into swab material or into TM.
- Rayon tipped and Dacron tipped swabs showed similar results. Either could be used successfully in the transport of B. pertussis cultures.
- Rayon tipped swabs were noted to be comparatively “harder” and did not absorb the bacterial suspensions as quickly.
- On a pernasal swab, Dacron tips may be more “comfortable” for the patient and may absorb swabbed material faster.
- Rayon tips may retain the integrity of the tip better.
- Preliminary evidence suggests that Venturi Transystem™ Amies TM may be more effective for the transport of B. pertussis cultures than Regan-Lowe TM when delays in transit occur. Venturi Transystem™ Amies TM may also provide a better holding medium for B. pertussis.
- One of the problems faced by many hospital laboratories is the infrequency of requests for pertussis culture while feeling compelled to maintain an inventory of expensive, short shelf-life pertussis TM. Amies TM is available commercially with pernasal swabs and may provide a convenient alternative.
- Earlier evidence suggested a difference between Dacron and rayon tipped swabs. We were not able to demonstrate a comparable difference with these two Copan fibers. Both fibers seem to support transport of fresh pertussis isolates.

### WHERE TO GO FROM HERE

- Test Amies TM without charcoal for both culture and amplified nucleic acid detection of B. pertussis.
- Compare Amies TM and Regan-Lowe TM with isolates from several geographic regions.
- Compare Amies TM and Regan-Lowe TM with specimens containing NP flora and respiratory secretions.

## REFERENCES