SYNONYMS: 

"Alcaligenes"
Alcaligenes Rhinotracheitis
Turkey Bordetellosis

Mild contagious upper respiratory disease of young turkeys (1 to 6 wks old; possible up to 20 weeks).
CAUSATIVE AGENT

*Bordetella avium*

Related agents include:

*Bordetella avium*-like
*Bordetella bronchiseptica*
*Alcaligenes faecalis*
CAUSATIVE AGENT (CONT.)

- Small gram (-) motile rod that grows in pinpoint grey smooth colonies.
- Similar to the organisms which cause atrophic rhinitis in pigs
- Kennel cough in dogs
- The bacteria produces toxins which degrade the cartilage
**INCUBATION PERIOD:** 7 to 9 days

**COURSE OF DISEASE:** 12 weeks  
(peak 2-3 weeks after onset)

**MORBIDITY:** Up to 100%

**MORTALITY:** Uncomplicated = 1-5%  
With *E. coli* or *Pasteurella* = up to 60-75%. Severity increases with environmental stress also.
METHODS OF SPREAD

1) Direct contact - nasal and ocular secretions
2) Contamination of water. Most turkeys still use trough waterers, although some are now using nipples in brood period which should decrease the problem.
3) Recovered birds can carry infection (important means of spread on multiage farms). This is common on turkey farms.
4) Human traffic - from older to younger birds.
5) Wild birds may act as reservoirs
COMMENT

- *B. avium* will damage the thymus and alter immune function resulting in immunosuppression.
- Birds that have been infected will respond poorly to subsequent vaccination.
- Use of *Pasteurella multocida*, NCD, or HE vaccine in infected poult's may result in mortality in response to the vaccine & susceptibility to subsequent challenge.
CLINICAL SIGNS

Non specific respiratory signs:

1. Voice change (loss of voice)
2. Snicking, flicking of head
3. Accumulation of mucus around nares and dirty shoulders
4. Huddling and depression, reduction in appetite, decreased weight gain. There can be severe variation in size of survivors which causes problems at processing.
5. Swollen sinuses, submandibular swelling
6. Conjunctivitis (foamy)
7. Dyspnea - acute
8. Rales - only sign in older birds
Gasping poult
Bordetellosis
Foamy eye
POSTMORTEM LESIONS

1) Catarrhal sinusitis and tracheitis (upper 1/3)

2) Trachea may collapse (weaken tracheal cartilage due to toxins)

3) Rarely tracheal plugs - due to ciliary malfunction

4) Submandibular edema

5) Secondary *E. coli* infections with pericarditis, perihepatitis, airsacculitis will cause mortality 4-5 weeks later
Flattened tracheas
Mild tracheitis, flattening
Collapsed trachea
Chronic tracheitis
Complicating colibacillosis
DIAGNOSIS

SUGGESTIVE

1. History: primarily on multi-age continuous confinement operations. Will spread from older to younger birds.

2. Clinical signs & postmortem lesions
DIAGNOSIS (CONT.)

SEROLOGY - May be useful (paired sera)
   ELISA not widely used

MUST DIFFERENTIATE FROM
   Cholera, NCD, Cryptosporidiosis
   MG, AI, Aspergillosis & Colibacillosis
DIAGNOSIS (CONT.)

POSITIVE

- Isolation and identification of causative agent from tracheas, sinuses, tracheal swabs (live birds)

- Will grow on MacConkey’s media.
### DIFFERENTIATION OF CAUSATIVE AGENTS

<table>
<thead>
<tr>
<th></th>
<th>MALONATE</th>
<th>UREASE</th>
<th>NO$_2$-NO$_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>B. avium</em></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>B. bronchiseptica</em></td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><em>A. faecalis</em></td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>B. avium</em>-like</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
PREVENTION

1) Clean out, wash & fumigate house with formaldehyde
2) Sanitize waterlines and water supply as soon as turkeys are moved
3) Litter management - remove wet spots, control dust
4) Maintain good ventilation
5) Control human traffic (young to old turkeys always)
PREVENTION (CONT.)

6) Prevent contact with wild birds - screen them out
7) Cull sick birds in convalescent flocks
8) Vaccination - won’t work well in presence of virulent strain, so clean up house.
   Artvax™ temperature sensitive mutant - so only grows in the upper respiratory tract - NC strain
   → 1d intraocular or spray - use
      Flashlight and do at night.
   → 14d water
   Effectiveness questionable
9) Monitor and control darkling beetle populations
TREATMENT

1. Conventional antibiotic therapy not effective (organism on surface of mucosa)
2. Tetracyclines & sulfas may help reduce losses due to secondary infections
3. Remove birds from infected house if possible
4. Improve air quality - ↑ Ventilation  
   ↑ Temperature  
   ↓ Crowding