



Meeting Summary West Nile Virus Conference 2003

New Orleans, LA

Sage Advice on Dealing with the Press

- “Sitting around with a N95 mask on a tailgate of a pick-up truck with kids around doesn’t make good press”
 - “Do it in your garage or where ever. You don’t need to do it on your tailgate.”
 - “Swab it in the bag and take it away so you don’t make a scene.”
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Sage Advice on Dealing with the Press

- “When it comes to West Nile, avoid denial”
 - “Its just like a home pregnancy test. You just get the results and bury them.”
 - “It only costs 25 cents, what do you want?”
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Sage Advice for Surveillance

- “Changing a case definition is like changing the constitution of a country.”
 - “Do you think Jesse understands the case definition?”
 - “Its nuts to stop testing after one bird.”
 - “People were dropping birds at the health dept. and we were mapping it.”
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Sage Advice on Mosquito Surveillance and Control

- “We need the best bang for the public health buck. We just can’t put out traps willy-nilly”
 - “The Sherwin-Williams approach of covering the whole earth with insecticides just won’t work.”
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Critical Questions

- Do we sufficiently understand the virus and its transmission dynamics in nature to optimize prevention of human infection?
 - Can we predict human risk?
 - Can we prevent human infection by urban vector control or other means?
 - When epizootics or human cases occur, can emergency action prevent human infection?
 - Can we optimally diagnose and treat human disease?
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Transmission dynamics

- Virus
 - Birds
 - Mosquitoes
 - Humans
 - Horses
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The Virus

- All strains >99.8% identical in USA
 - Viral strain specific differences in viremia and mortality in birds (NY99>Kenya98>Kunjin)
 - New strain (NY99) relates to frequency of severe neurological disease
 - Virus may persist in some tissues/organs in some animals (humans?)
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Birds

- 162 species affected
 - Substantial population reductions in some species
 - Viremia up to 9-11 logs in some birds
 - Blue jay, grackle, finch, Am. Crow, sparrow
 - High viral levels in oral and cloacal swabs and feces
 - Approx. 30% birds infected in epizootic areas; <1% in enzootic areas
 - Novel transmission modes – importance?
 - Bird-to-bird
 - Oral
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Mosquitoes

- 37 infected species to date
 - *Cx. pipiens/restuans*, *Cx. quinquefasciatus*, *Cx. tarsalis* important enzootic vectors
 - Potential competent bridge vectors
 - *Ae. albopictus*, *Ae. salinarius*, *Oc. japonicus*
 - Vertical transmission may be important in some species
 - Temperature dependence on extrinsic incubation period and disseminated infection
 - Diverse overwintering mechanisms likely
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Ecological Factors in Transmission

- Virus exists in complex biologic systems in nature influenced by many factors.
 - We cannot yet predict epizootics.
 - Epizootics tend to be focal and develop quickly.
 - Epizootics may portend future human infections
 - Need to study ecological determinants of transmission.
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Horses

- Huge epizootic in mid-west
 - *Cx. tarsalis*?
 - Low level viremias
 - Equine vaccine now licensed, estimated 94% efficacy
 - Other vaccines under development
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Humans

- >4000 cases
 - 4 years of continued transmission in NY
- Viremia is low (generally <100 PFU/ml)
 - May be prolonged in immunosuppressed
 - Viral persistence in organs or tissues? Long-term sequelae?
- Novel transmission modes –
 - Organ transplant and blood transfusion
 - Intrauterine and breast milk – importance?
 - Needlestick
- Protection from heterologous flavivirus exposure?

Human Illness

- Age by far most important risk factor
 - Immunosuppression?
 - AFP syndrome
 - Movement disorders very common
 - Long-term clinical outcome poor?
 - Costly: \$5.5 million inpatient in LA
 - No proven treatment
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Human Diagnostics

- MAC-ELISA best for clinical diagnosis
 - Problem with secondary flavivirus infections
 - NAAT insensitive for clinical diagnosis
 - NAAT assays being developed for blood donor screening
 - Sensitivity?
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Predicting Human Illness

- Single WNV dead bird predicts future human disease
 - High sensitivity, low specificity
 - Horses, sentinel chickens also predictive in some areas
- Quantifiable measures of epizootic activity seem to predict human disease
 - WNV dead bird density, dead bird reports, MIRs, early WNV birds, etc. correlate with future risk
 - Short lead time
 - Differences in surveillance limit analysis
 - Moving target?

Preventing Human Illness

- Vaccine: no time soon
 - Message tailored to different audiences
 - Public, health care providers, political and community leaders
 - Personal protection:
 - Reasonable knowledge, little action
 - Message tailored to different audiences
 - Different audiences need different messengers
 - Social marketing, sustained effort
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Preventing Human Illness

- Vaccine: no time soon
 - Personal protection: reasonable knowledge, little action
 - Mosquito control
 - Does integrated pest management prevent human illness? Need data.
 - Emergency control:
 - Sustained control effort resulted in dramatic decrease in densities of important vectors, but lack clear evidence of efficacy on reducing human illness
 - How much, where, when, what triggers?
 - Lawsuits galore
 - ULV results in non-measurable exposure to humans
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Workgroup Summaries

Surveillance Issues

- Add clinical syndromes with definitions
 - Add new modes of transmission: *timeliness!*
 - Optional: extended variables
 - “Opt-out” verification step
 - Eliminate human and non-human, mammal denominator data
 - Oral swabs for corvids, VecTest
 - Need for some consistency? Minimum surveillance?
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Laboratory Issues

- Biosafety levels: being reconsidered.
 - No major changes in diagnostic schemes.
 - Commercially produced reagents coming available
 - Commercial EIA tests coming available.
 - Interpretation: flavivirus positive.
 - Neutralization: where, when, how (Chimerivax?)
 - Problems with secondary infections.
 - Spinal fluid important.
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Prevention and Control Issues

- Minimal mosquito abatement program capabilities
 - Public education/communication program
 - Mosquito abatement capability tailored to local resources
 - Differences in opinion of methods for urban *Culex* control (e.g., container breeding)
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Prevention and Control Issues

- What personal prevention measures advocated in guidelines? Need for simplicity of message in a way people can understand.
 - How to produce behavior change?
 - Long-term effort
 - Use provider community
 - Clear and consistent message
 - Need to motivate, not just educate
 - Target education dollars (e.g., older persons, pregnant women?)
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Biology and Ecology Issues

