BARDA MCM Progress

HHS PHEMCE Stakeholders Workshop
Arlington, VA
September 24, 2008

Dr. Robin Robinson
Director
HHS/ASPR/BARDA
Federal Planning and Funding Initiatives

BARDA

CBRN
National Strategy to Combat WMD (HSPD-4)
Dec. 2002
Biodefense for the 21st Century (HSPD-10)
April 28, 2004
Project BioShield Act
July 21, 2004
Medical Countermeasures Against WMD (HSPD-18)
January 31, 2007
HHS PHEMCE Strategy & Implementation Plan
March/April, 2007

PANDEMIC FLU
National Strategy for Pandemic Influenza
Nov. 1, 2005
HHS Pandemic Influenza Plan
Nov. 2, 2005
Emergency Supplemental Appropriations (P.L. 109-148)
Dec. 30, 2005
Emergency Supplemental Appropriations (P.L. 109-234)
June 15, 2006

ALL HAZARDS
Pandemic and All-Hazards Preparedness Act
Dec. 19, 2006
Draft BARDA Strategic Plan
July 5, 2007
Public Health & Medical Preparedness (HSPD-21)
October 18, 2007
BARDA 2008 Accomplishments

• PAHPA
  - Establish BARDA & appoint Director
  - Implemented integrated product portfolio with heavy emphasis on **advanced development** followed by acquisition of near-licensure products
  - Developed amendment for **PREP Act declaration** for H5N1 vaccine to include H7 & H9 vaccines
  - Utilized BARDA **antitrust exemption** for Mix-N-Match studies with multiple manufacturers and HHS agencies

• INTRAMURAL STUDIES
  - Began program to determine feasibility of pre-pandemic flu vaccine with different adjuvants under EUA

• REGULATORY
  - Submitted **EUAs** (2) for anthrax antibiotic MedKits for USPS and 1st responders
  - Worked with NIAID on **IND** filing for H5N1 vaccine with adjuvants for Mix-N-Match Phase 1 clinical studies
PHEMCE Implementation Plan: Top Priority Medical Countermeasure Acquisitions

**Near-Term**
**FY 2007-08**
- Broad-Spectrum Antibiotics
- Anthrax Vaccine(s)
- Smallpox Vaccine
- MCMs for Rad/Nuc Threats

**Mid-Term**
**FY 2009-13**
- Broad-Spectrum Antibiotics
- Diagnostics
- Anthrax Antitoxin(s)
- Filovirus MCMs
- Smallpox Antiviral(s)
- MCMs for ARS and DEARE
- Radionuclide-Specific MCMs
- Rad/Nuc: Biodosimetry/Bioassay(s)
- Enterprise CHEMPACKS

**Long-Term**
**Beyond FY 2013**
- Broad-Spectrum Antivirals
- Volatile Nerve Agent Antidote(s)

CBRN MCM Accomplishments

• PHEMCE ENTERPRISE
  – Completed successful transition of MCM development (MVA vaccine, bot antitoxin, anthrax antitoxins) from NIAID, CDC, and DoD to BARDA and of stockpile acquisition from BARDA to CDC/SNS
  – Implemented PHEMCE implementation plan
  – Provided stewardship of PHEMCE Enterprise governance bodies (EGB & EEC)

• SMALLPOX
  – Prototype for BARDA model for advanced development & PBS stockpile acquisition
  – Continued development of smallpox MVA vaccine under contract with Bavarian Nordic from NIAID for expected delivery of 20 M doses in 2009
  – WMD WG requirement setting for special populations
  – Animal model development (3) & regulatory acceptance
  – EUA guidance
CBRN MCM Accomplishments

• ANTHRAX
  – Continued acquisition of AVA vaccine from Emergent for joint U.S. civilian-military anthrax vaccine stockpile to 18 M doses (BARDA → CDC/SNS) & development of post-exposure prophylaxis indication, extended product stability, adjuvant formulations (CpG), & potency assays
  – Issued new solicitation (Feb. 08) for development/acquisition of rPA vaccine with contract awarding by expected end of 2008
  – Continued development & acquisition of anthrax antitoxins - polyclonal Abs (Cangene, HGS, Emergent) and mAbs (Emergent, Elusys, Pharmathene)
  – Began development of Medkit (doxycycline) for 1st responders & general population (palability & label comprehension studies) & acquisition for 1st responders (EUA)

• BOTULISM
  – Established horse farm for production of equine-derived botulinum antitoxin, developed plasmaphoresis, & implemented GLPs (CDC → BARDA)
  – Continued production & acquisition with Cangene of heptavalent botulinum antitoxin for delivery of 200 K t.c. thru 2011
• ACUTE RADIATION SYNDROME
  – Acquired ARS chelating agents (DTPA, KI, Prussian Blue) using PBS for SNS
  – Awarded contracts (7) for development of broad array (small molecule, cytokines, stem cells) of ARS therapeutics for multiple indications (Sept. 08)
  – Issued new solicitation (Mar. 08) for development/acquisition of ARD therapeutics for neutropenia indication with contract awarding by expected end of 2008
CBRN: Acquisition
• RFP-BARDA-08-15: Recombinant Protective Antigen (rPA) Anthrax Vaccine for the Strategic National Stockpile
• HHS-BARDA-08-10 (RFP): Advanced Therapeutics for Treating Neutropenia Resulting from Acute Exposure to Ionizing Radiation
• RFP-BARDA-08-12: Medkits
• CBRN: Advanced Development
• BAA-NIH-BARDA-NIAID-DMID-A12007007: Biodefense Vaccine Enhancement
• BAA-DMID-NIAID-BARDA-NIHAI20080022: Application of Platform Technologies for the Development of Therapeutics for Biodefense
• CBRN: Request for Information/Sources Sought:
• RFI-BARDA-08-21A: Physical and Biological Dosimetry Techniques and Devices Useful in Initial Triage after Radiologic and Nuclear Events
• SS-HHS-BARDA-08-99: Emergency Responder Anthrax Antimicrobial Kits
CBRN MCM Next Steps

• **Vaccines**
  • Develop filovirus vaccines
  • Develop 3rd generation anthrax vaccines

• **Therapeutics**
  • Develop ARS biologicals for multiple indications
  • Develop new chemical antidotes

• **Antivirals/Antibiotics**
  • Develop smallpox antivirals
  • Develop broad spectrum antibiotics
  • Support anthrax antibiotic MedKit studies

• **Diagnostics**
  • Develop biodosimetry devices
  • Develop multiantigen detection devices
# BARDA Pan Flu Integrated Program Portfolio Approach

<table>
<thead>
<tr>
<th>34 contracts &amp; 3 grants totaling $4.2 B</th>
<th>Vaccines</th>
<th>Antivirals</th>
<th>Diagnostics/Respiratory Devices</th>
</tr>
</thead>
</table>
| Advanced Development                   | Cell-based Antigen-sparing Next Generation Recombinant | Peramivir More to Come | **Diagnostics**  
Point of Care  
Clinical Lab  
Ventilators  
Next Generation |
| Stockpile Acquisitions                 | H5N1 Pre-Pandemic Vaccine Stockpiles | Tamiflu & Relenza Federal Stockpiles  
State Stockpiles  
AV MedKits | Masks & Respirators |
| Infrastructure Building                | Retrofit Mfg Facilities  
Build New Cell-based Mfg Facilities  
Egg-based Supply  
U.S. PANDEMIC VACCINE GOAL TIMELINES
(300 M Vaccine Courses)

<table>
<thead>
<tr>
<th>Year</th>
<th>Ag Alone (90 ug)</th>
<th>Adjuvants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>115.4</td>
<td>12.8</td>
</tr>
<tr>
<td>2008</td>
<td>52.9</td>
<td>5.9</td>
</tr>
<tr>
<td>2009</td>
<td>23.7</td>
<td>2.6</td>
</tr>
<tr>
<td>2010</td>
<td>10.4</td>
<td>1.2</td>
</tr>
<tr>
<td>2011</td>
<td>5.7</td>
<td>0.6</td>
</tr>
</tbody>
</table>
## U.S. H5N1 Vaccine Stockpile Inventory: 2008

<table>
<thead>
<tr>
<th>Vaccine Strain</th>
<th>Clade</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/VTN/1203/04</td>
<td>1</td>
<td>0.22</td>
<td>4.33</td>
<td>0.78</td>
<td>1.08</td>
<td>6.39</td>
<td></td>
</tr>
<tr>
<td>A/Indo/05/05</td>
<td>2.1</td>
<td>6.25</td>
<td>6.25</td>
<td>2.2</td>
<td>0.04</td>
<td>8.54</td>
<td></td>
</tr>
<tr>
<td>A/BHG/QL/1A/05</td>
<td>2.2</td>
<td></td>
<td>6.41</td>
<td></td>
<td>6.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A/Anhui/1/05</td>
<td>2.3</td>
<td>2.56</td>
<td></td>
<td>2.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals (90 ug/dose)</td>
<td></td>
<td>0.22 M</td>
<td>4.33 M</td>
<td>7.03 M</td>
<td>11.22 M</td>
<td>1.12 M</td>
<td>23.92 M</td>
</tr>
<tr>
<td>Totals w/adjuvants</td>
<td></td>
<td>2.64 M</td>
<td>51.96 M</td>
<td>84.36 M</td>
<td>134.64 M</td>
<td>13.4 M</td>
<td>287.04 M</td>
</tr>
</tbody>
</table>

! Adjusted for usage and potency (as of 09/22/08)

- **Stockpile manufacturing requirements:**
  - Produce U.S.-licensed seasonal influenza vaccines
  - Store, test, formulate & fill in U.S.
  - Able to manufacture H5N1 bulk vaccine at commercial scale
Vaccines: Infrastructure Building

- Novartis – new cell-based flu vaccine manufacturing facility started 2007
Influenza Vaccine Production Capacity: HHS Accomplishments

- Supported the development and licensure of the first H5N1 vaccine named the number one technological advance in 2007
- Established the first and largest pre-pandemic vaccine stockpile in the world that represents multiple H5N1 virus strains
- Supported advanced development of new cell-based influenza vaccines towards U.S. licensure accompanied by concomitant expansion of domestic vaccine manufacturing surge capacity 3-4 fold by 2012
- Supported advanced development of H5N1 influenza vaccines using antigen-sparing techniques towards U.S licensure expected by 2009 leading to the technological breakthrough of new vaccine adjuvants that expand pandemic vaccine manufacturing capacity by 10-20 fold and that may provide cross-protection against influenza genetic variants
- Supported retrofitting of existing U.S. manufacturing facilities that increases egg-based pandemic influenza vaccine production capacity by 150 million doses by 2011 & provides production of live, attenuated influenza vaccine completely within the U.S.
- Secured year-round egg supply and other materials needed for uninterrupted domestic manufacturing of seasonal and pandemic influenza vaccines
Influenza: Advanced Development

- RFP-BARDA-07-06 Advanced Development of Recombinant Influenza Virus Vaccines
- HHS-BARDA-08-20: Advanced Development of Next Generation Portable Ventilators
MedKits

- Stockpiling of MCM for businesses, healthcare organizations, & individuals to address dispensing timing issues
- Personal preparedness measure: home stockpiling
- CDC-sponsored MedKit concept for anthrax antibiotics (2004): St. Louis compliance study
- BARDA projects developing MedKits for influenza antivirals & anthrax antibiotics
- Home antimicrobials stockpiling guidances
- USPS & 1st responders (EUA)
• Vaccines
  • Continue advanced development of vaccines
  • Continue expansion of pre-pandemic vaccine stockpile
  • Continue expansion of domestic manufacturing surge capacity
  • Stockpile syringes/needles for pre-pandemic vaccines

• Antivirals
  • Complete State AV stockpiles for treatment
  • Procure federal share of outbreak antivirals for prophylactic usage
  • Continue & expand advanced development of antivirals
  • Support antiviral MedKit studies

• Diagnostics
  • Facilitate development of simple influenza virus detection devices

• Other Countermeasures
  • Issue guidance for masks & respirators
  • Develop next generation ventilators
New Perspectives

• Turning the page → Integrated BARDA programs
• USG One Portfolio MCM approach
• Advanced development
• PAHPA-modified BioShield for stockpile acquisitions
• MCM product market sustainability
• Innovation
• Extramural/Intramural activities
• New public-private bioproduction/development MCM facility approaches
Challenges

- Funding CBRN MCM advanced development
- Funding remaining pan flu MCM projects
- BARDA organizational growing pains
- Staffing with public health, scientific, & technical experts
- Coordination with CONOPS & end-users
- Establishment of intramural programs
- Building the BARDA bridges over the “Valley of Death”
BARDA Contact Info

BARDA:
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E-Mail: BARDA@hhs.gov
- Upcoming Events
- Acquisitions
- BioShield
- Influenza Programs

MedicalCountermeasures.gov
- Federally-sponsored conferences
- Funding opportunities
- Resource programs
- Regulatory guidance
- Federal strategies and reports