DoD Chemical Biological Defense Program

Joseph M. Palma, MD, MPH
Colonel, USAF, MC, SFS
Deputy & Medical Director,
Chemical Biological Defense
and Chemical Demilitarization Programs

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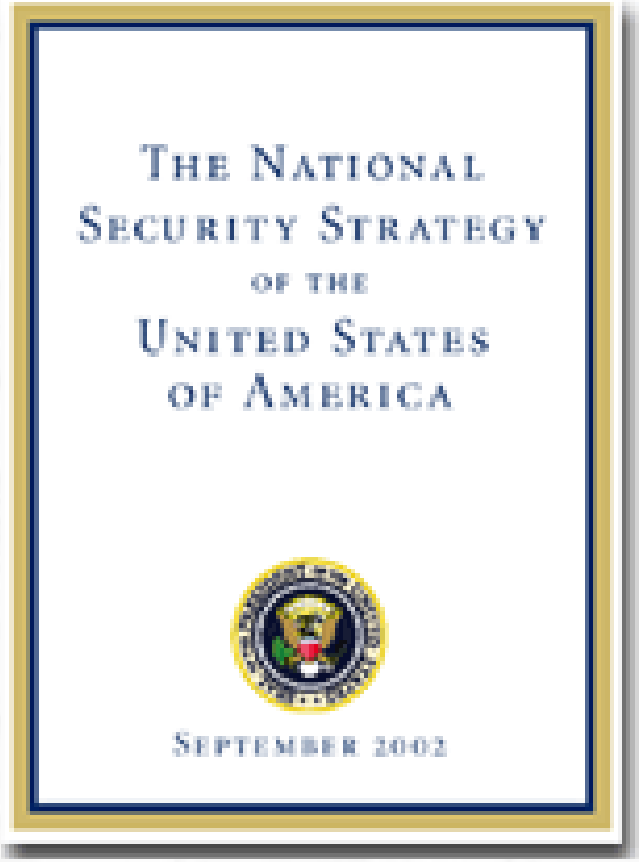
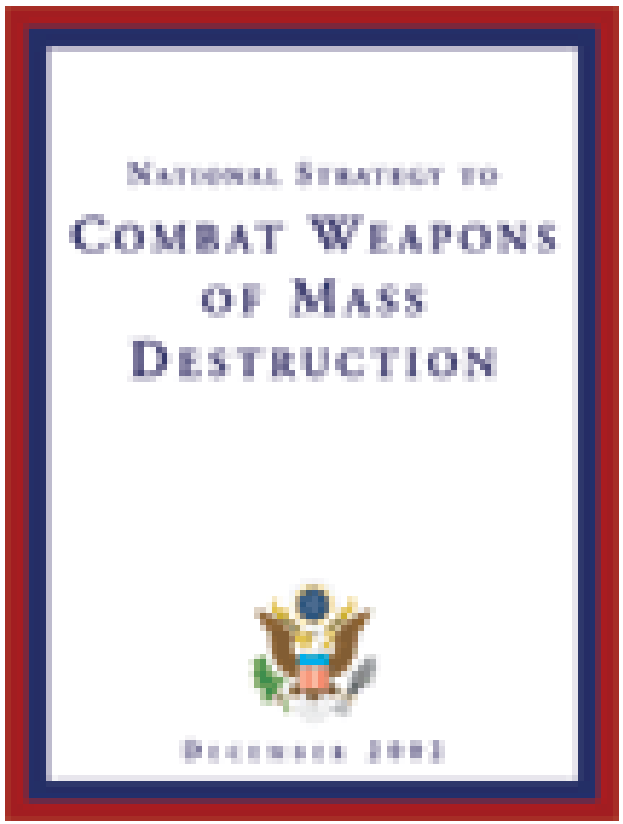
Chemical Biological Individual Protection Conference

Guidance

National Security Strategy of the United States of America



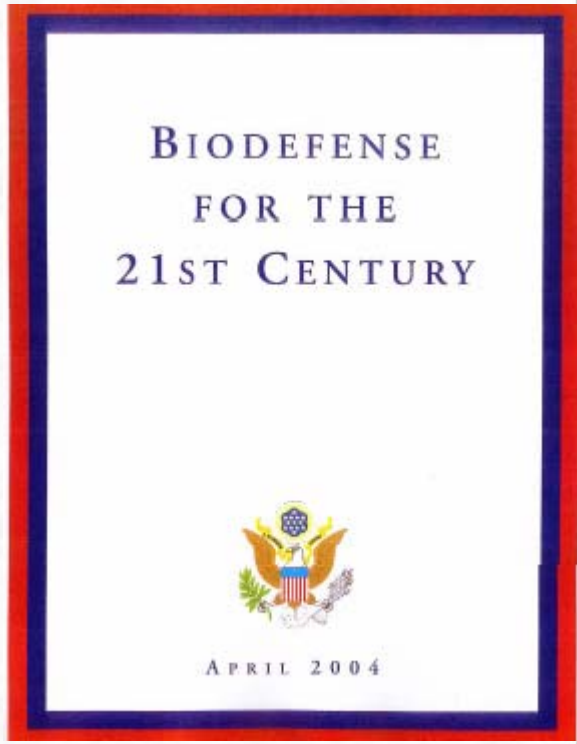


National Strategy to Combat Weapons of Mass Destruction

National Strategies Addressing Emerging Threats

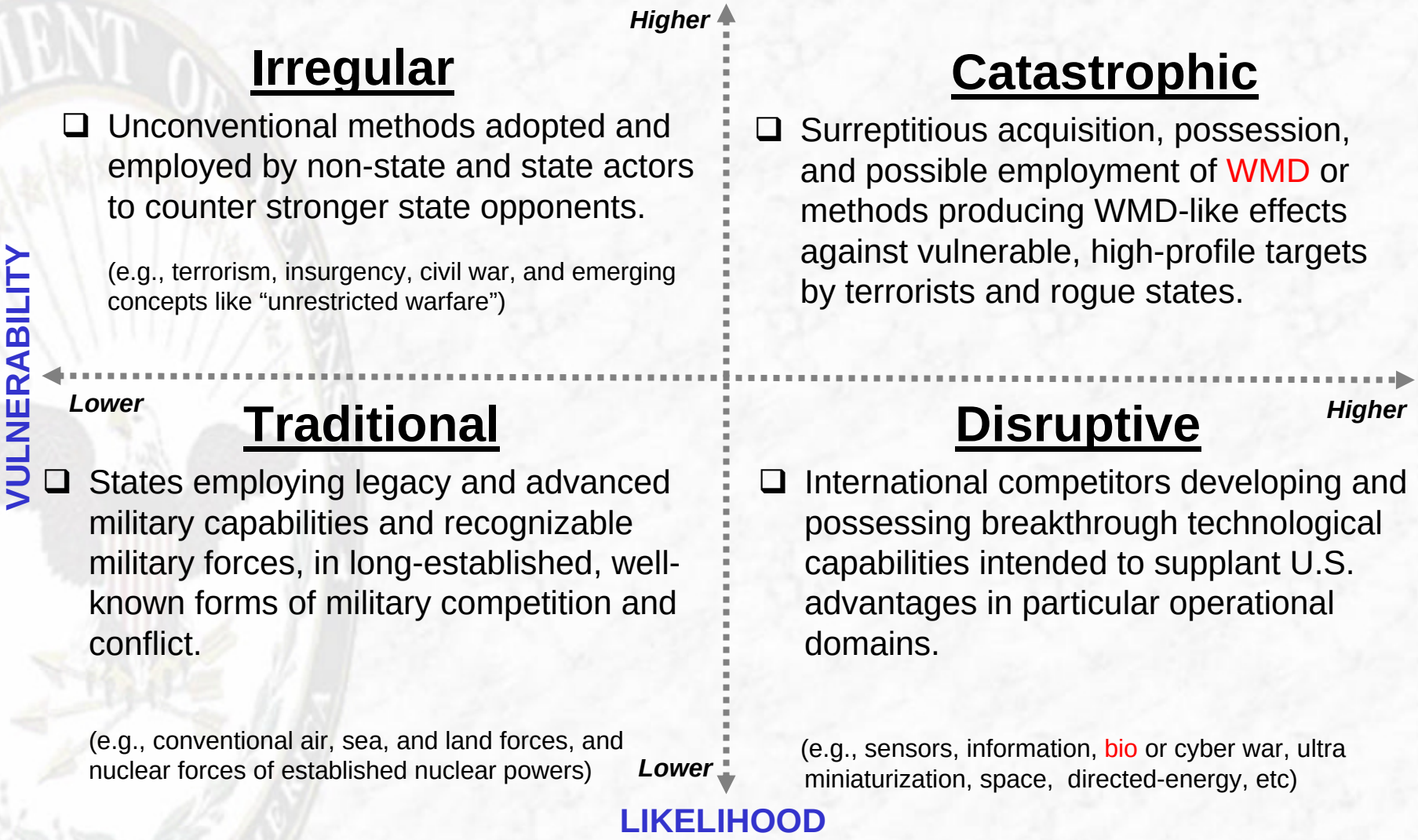
***Biodefense for the 21st Century*, The White House, April 2004 (NSPD-33/HSPD-10)**

- "Preventing and controlling future biological weapons threats will be even more challenging. Advances in biotechnology and life sciences—including the spread of expertise to create modified or novel organisms—present the prospect of new toxins, live agents, and bioregulators that would require new detection methods, preventive measures, and treatments. These trends increase the risk for surprise"
- "The proliferation of biological materials, technologies, and expertise increases the potential for adversaries to design a pathogen to evade our existing medical and non-medical countermeasures. To address this challenge, we are taking advantage of these same technologies to ensure that we can anticipate and prepare for the emergence of this threat."



Defense Strategy

Security Environment: 4 Challenges



No hard boundaries distinguishing one category from another

CBDP Vision and Mission

VISION

DoD Operations Unconstrained by CB Effects

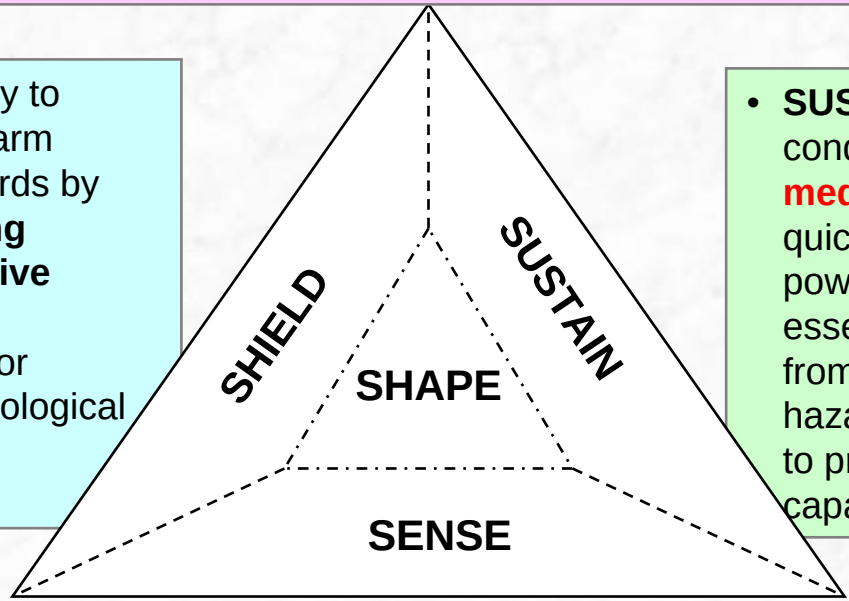
MISSION

Provide passive defense CB capabilities in support of the National Military Strategies.

Joint Defense Functional Concept – Operational Attributes

- **SHAPE –** Provides the ability to **characterize the CBRN hazard** to the force commander - develop a clear understanding of the current and predicted CBRN situation; collect, query, and assimilate info from sensors, intelligence, medical, etc., in near real time to inform personnel, **provide actual and potential impacts of CBRN hazards**; envision critical SENSE, SHIELD and SUSTAIN end states (preparation for operations); visualize the sequence of events that moves the force from its current state to those end states.

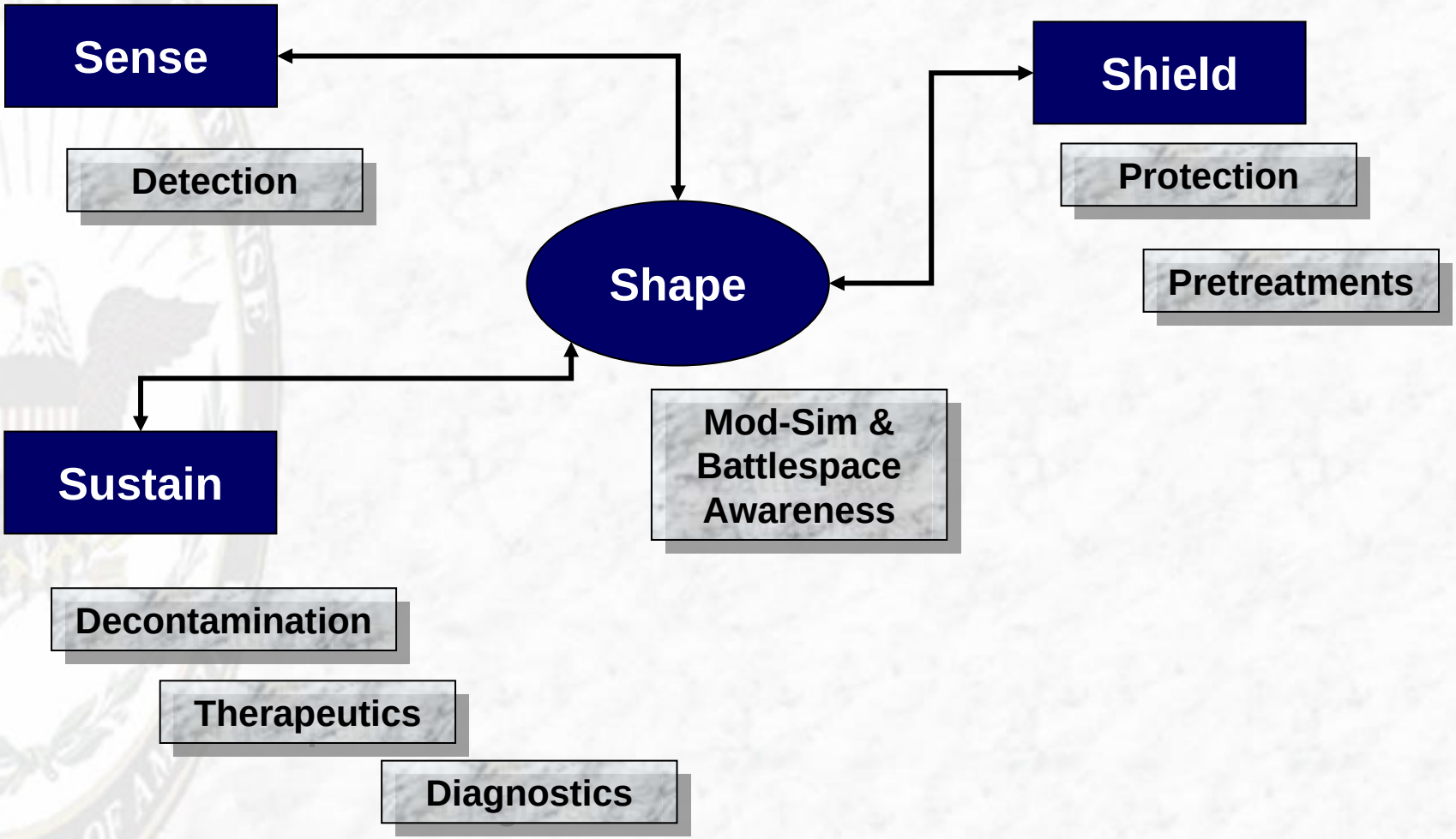
- **SHIELD –**The capability to shield the force from harm caused by CBRN hazards by **preventing or reducing individual and collective exposures**, applying prophylaxis to prevent or mitigate negative physiological effects, and protecting critical equipment



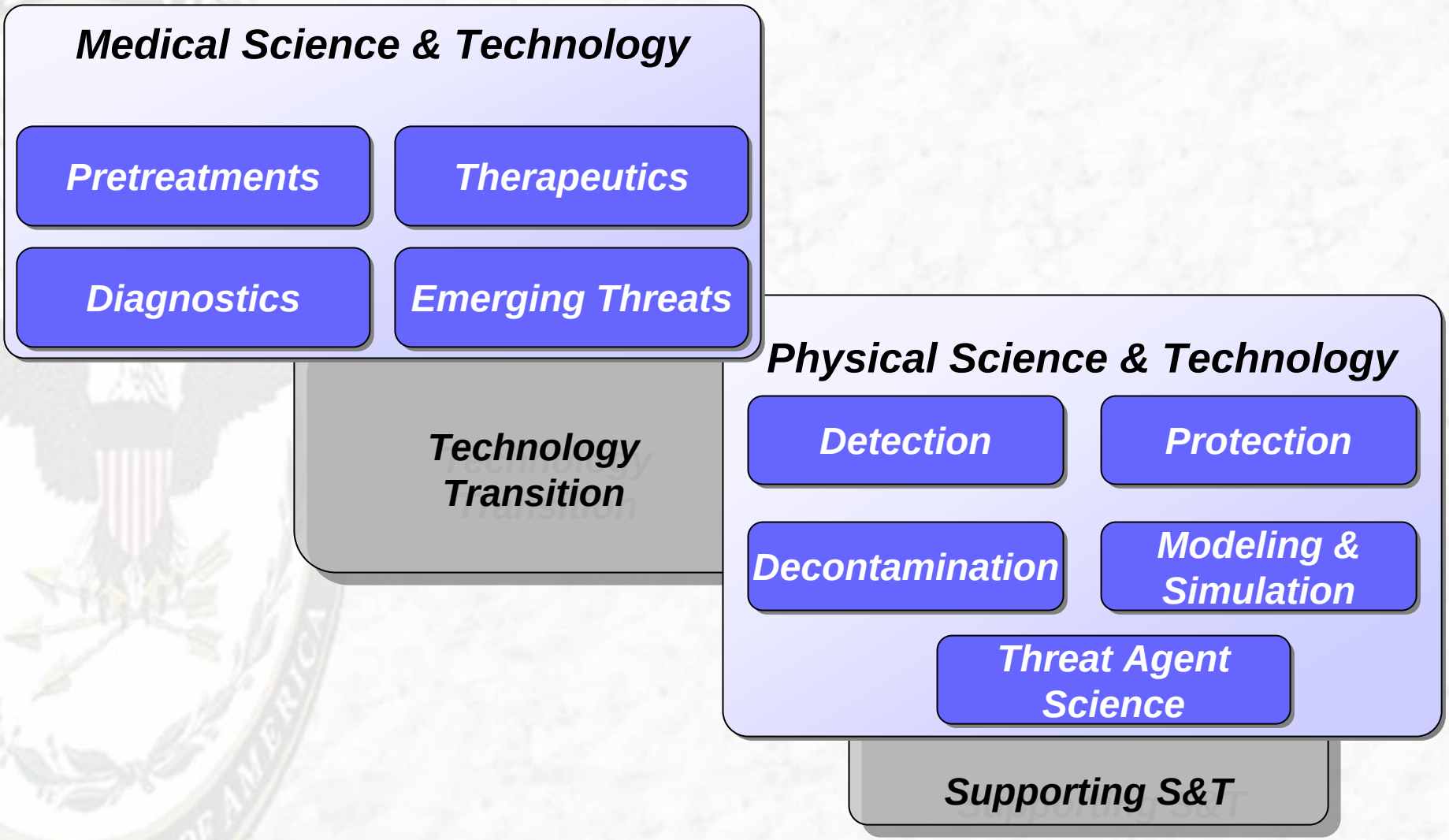
- **SUSTAIN –** The ability to conduct **decontamination** and **medical** actions that enable the quick restoration of combat power, maintain/recover essential functions that are free from the effects of CBRN hazards, and facilitate the return to pre-incident operational capability as soon as possible.

- **SENSE –** The capability to continually provide the information about the CBRN situation at a time and place by **detecting, identifying, and quantifying** CBRN hazards in air, water, on land, on personnel, equipment or facilities. This capability includes detecting, identifying, and quantifying those CBRN hazards in all physical states (solid, liquid, gas).

Chemical Biological Defense Program Capability Areas



Chemical Biological Defense Science & Technology (S&T) Capability Areas

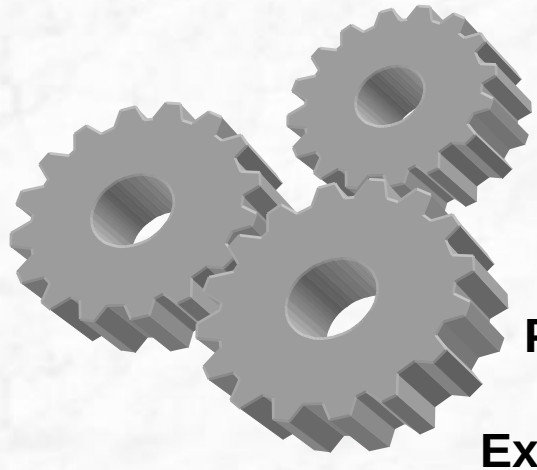


ATSD(NCB)

- **Advise SECDEF on policies and plans affecting WMD threat reduction**
- **Provide Oversight of DoD Nuclear, Chemical and Biological Defense Programs**

DoD Decision Support Processes

Joint Capabilities Integration and Development System (JCIDS)



Defense Acquisition System

Planning, Programming, Budget and Execution System (PPBES)

Chemical and Biological Defense

CB Threats & Hazards

Agent Delivery → Doses on Target → Downwind Dispersal → Doses Absorbed → Symptoms → Sustained Combat

Medical Pretreatment

Contamination Avoidance and NBC Battle Management

Individual & Collective Protection

Installation Force Protection

Medical Treatment

Information Systems

Decontamination and Restoration

An integrated response to the threat is required – There will be no silver bullet!

Key Initiatives for the CB Defense Program

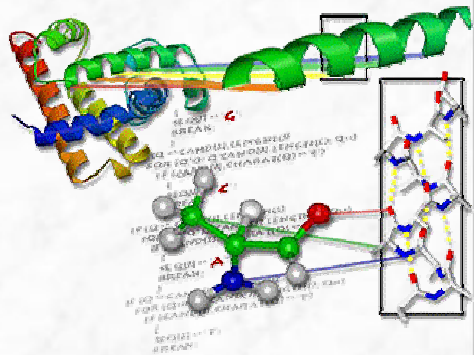
Infrastructure Improvements

- Test & Evaluation Facilities
- Non-Traditional Agent Test Chamber
- USAMRIID Recapitalization

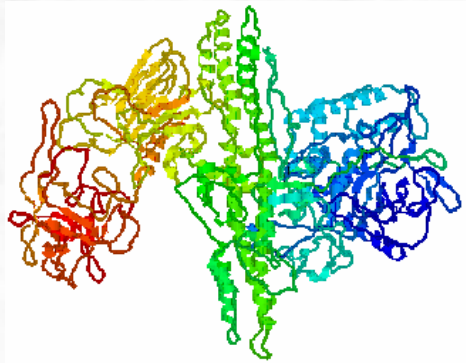
RDT&E Areas of Additional Emphasis

- S&T for Non-Traditional detection
- Biological point and standoff detection
- Chemical point detection
- Medical Prophylaxis
- Battle Analysis
- Decontamination
- Bio Defense Initiatives (Advanced Medical Countermeasures)

Improved Oxime



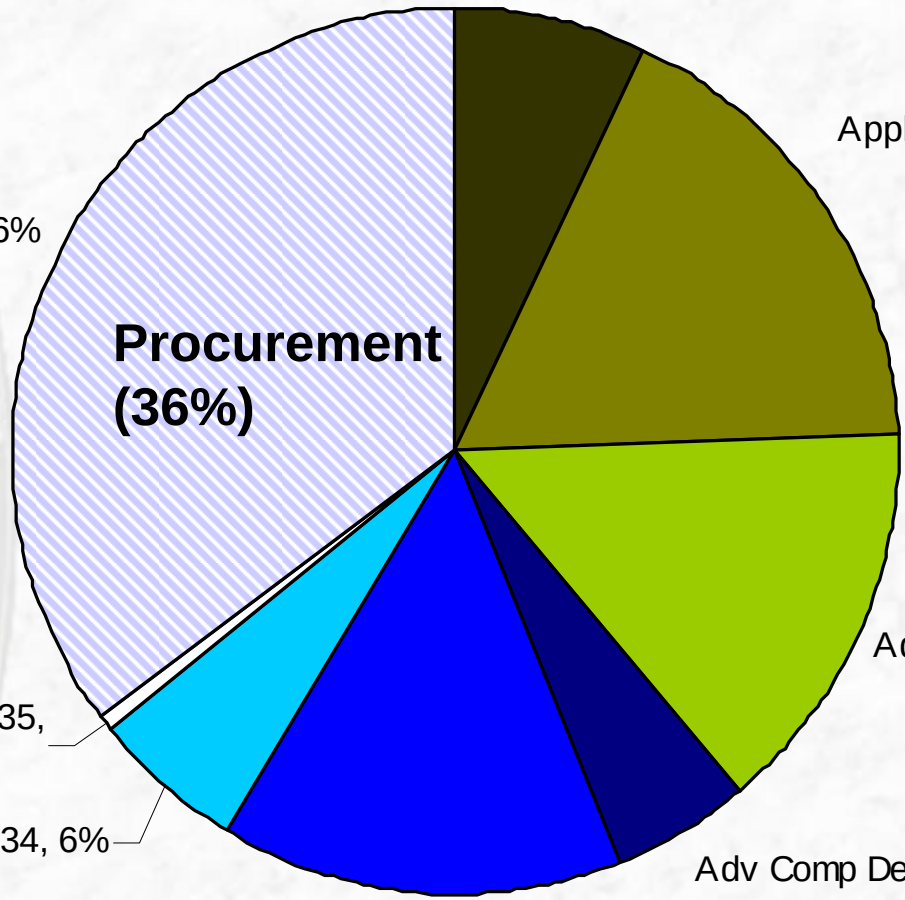
Nerve Agent Bioscavener Pretreatment



Chemical Biological Defense Program

Based on FY07 President's Budget Request (February 2006)

$1.435 Billion



Science & Technology Base (38%)

Advanced Development (26%)

Quadrennial Defense Review (QDR):
Vision for Combating Weapons of Mass Destruction

The future force will be organized, trained, equipped, and resourced to deal with all aspects of the threat posed by weapons of mass destruction. It will have capabilities to:

- **Detect WMD, Including Fissile Material At Stand-off Ranges**;
- **Locate And Characterize Threats**;
- **Interdict WMD** And Related Shipments Whether On Land, At Sea, Or In The Air;
- **Sustain Operations Under WMD Attack**; And
- **Render Safe Or Otherwise Eliminate WMD Before, During Or After A Conflict**.

The Department will **develop new defensive capabilities** in anticipation of the continued evolution of WMD threats. Such threats include … genetically engineered biological pathogens, and next generation chemical agents. The Department will be prepared to respond to and help other agencies to mitigate the consequences of WMD attacks.

Quadrennial Defense Review (QDR):
Implementing the Combating WMD Vision

To achieve the characteristics of the future joint force…, the Department will:

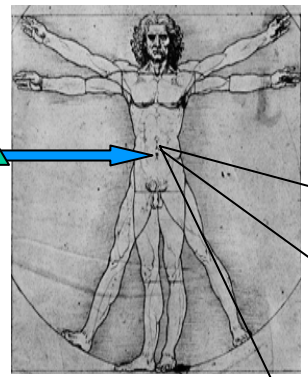
- Designate the Defense Threat Reduction Agency to be the primary Combat Support Agency for **U.S. Strategic Command** in its role as lead combatant commander for integrating and synchronizing combating WMD efforts.
- Expand the Army's 20th Support Command (CBRNE) capabilities to enable it to serve as a Joint Task Force capable of rapid deployment to command and control WMD elimination and site exploitation missions by 2007.
- Expand the number of U.S. forces with advanced technical render-safe skills and increase their speed of response.
- Improve and expand U.S. forces' capabilities to locate, track, and tag shipments of WMD, missiles, and related materials, including the transportation means used to move such items.
- Invest **more than $1.5 billion over the next five years to develop broad-spectrum medical countermeasures against advanced bio-terror threats**, including genetically engineered pathogens.

Medical Countermeasures Against Advanced Bio Threats

Today's Threats

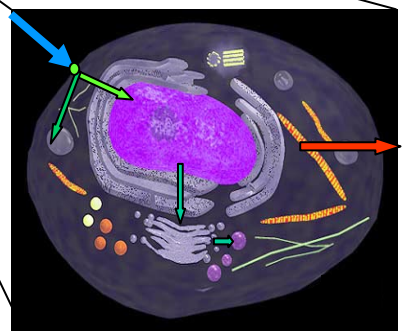
- *Anthrax*
- *Smallpox*
- *Botulinum*
- *Plague*
- *Tularemia*
- *Ebola/Filo*
- *Hemorrhagic Fever*
- *Encephalitis*
- *SARS*
- *Influenza*
- *Ricin/SEB, others*

Bioengineered



Modes of Action

- *Receptor Binding*
- *Signal Transduction*
- *Decoys*
- *Immune Avoidance*
- *Translation/Transcription*
- *Immune Deregulation*
- *Replication*
- *Virulence Expression*



Parallel Systems Approach

Solutions

Target Agent Commonalities

- Block Key Receptors
- Inhibition by Small Molecules
- Modulate Immunity
- Change Gene Expression
- Block Protein Actions
- Modulate Physiologic Impacts

One *PIECE* at a time → Process Analysis → Broad Spectrum

Broad Spectrum Therapies for Novel Biodefense Threats

- **Basic Research/Science**
  - Directed at critical pathways in pathogen & host response
  - Identify the novel points of intervention
- **Applied Research/Science**
  - Expanding technologies
  - Speed the cycle from discovery to license application
- **Advanced Science/Tech Development**
  - Quick wins based on new compounds and technology
  - Minimum: Deliver products with IND approval (Phase 1 trials) for BioShield acceptability and further investment
- **Advanced Component Development and System Demonstration**

CBDP: The Way Ahead

- **Need to build on current strengths…**
  - Integrated collection of systems
  - Multi-disciplinary approaches
  - Well developed doctrine and concepts for the military in operational environments
- **…while recognizing a changing environment**
  - Laboratory and other infrastructure may need overhaul
  - DoD now a key player, but no longer the biggest investment
  - Operational environment must consider homeland
  - Emerging and non-traditional threats may be critical
  - Congress will continue to play an active role
  - Industry will be increasingly important, though DoD-unique assets need to be identified and maintained

CBDP: The Way Ahead

- **…and Planning for the Future**
  - Need to balance investment between current risks (operational and procurement needs) and future risks (S&T and infrastructure)
  - Coordination with other agencies (DHHS, DHS, and others) for an effective national effort
    - DoD may play key role in transitioning technologies from laboratory concepts to field-ready systems, especially medical systems
  - Broad-spectrum, dual-benefit approaches will need to be evaluated in all areas

Questions?