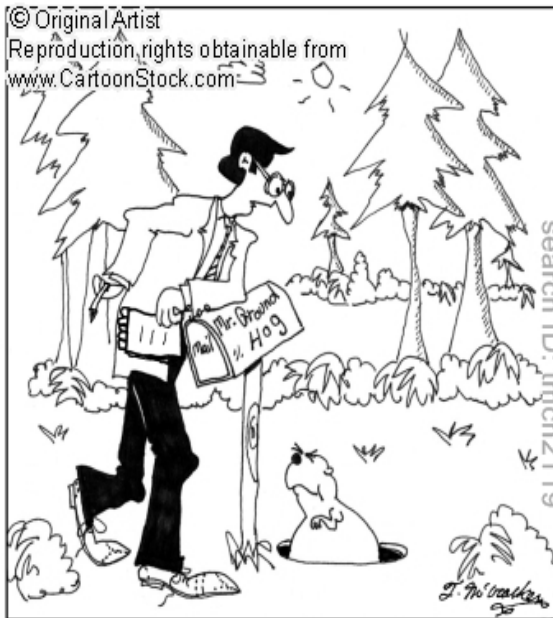


UNDERSTANDING THE PUBLIC'S PROTECTIVE ACTION DECISIONS FROM WEATHER WARNINGS:



"I'm going to need a Margin of Error or
I can't publish your prediction of
six more weeks of winter."

Why Some People May Make the Wrong Decisions

Laura Myers, PhD
Research Professor
Mississippi State University

WEATHER WARNINGS

- ◉ Weather warning systems provide accurate and timely awareness of pending weather events.
- ◉ Continuous information and necessary warnings about potential and actual weather dangers provided by...
 - Weather professionals and meteorologists
 - Emergency management
 - Broadcast news
 - Other sources

WARNING INFORMATION

- Warning information may require...
 - evacuation
 - sheltering in place
 - seeking a hardened shelter
 - securing property
 - having an increased awareness that the weather could worsen over time and people should be vigilant



WHAT PEOPLE DO...

- Even with plenty of warning time and very specific information about the severity of the weather situation...
 - not all people heed the warnings
 - or take the correct protective action



PSYCHOLOGY OF PROTECTIVE ACTION DECISIONS

○ Demographics

- Age
 - Younger and older
- Gender
 - Female and male
- Education
 - Higher education levels
- Geography
 - Location
 - Propensity for extreme weather

○ Anxiety

○ Trust

○ Ignoring weather information

○ Readiness/Planning

○ Plans affected...

○ Understanding weather information...Watch versus Warning?

ANXIETY

- Predictor of...
 - Trust
 - Ignoring weather information
 - Perception of weather affecting plans
- Underprepared and over-prepared
 - Complacency
 - Shadow evacuations
- Anxiety not related to geography



OTHER DEMOGRAPHICS

- Most people report weather information is reliable
- Large majority are at least neutral about weather information
- Most have trust in the National Weather Service
 - Blacks, Californians, and those with the least anxiety have less trust than other groups
- Planning
 - Californians, Asians, and younger people least likely to plan
 - Native Americans and older people most likely to plan
- Ignore weather information
 - Males more than females
 - Oklahomans most likely to ignore-overexposure to weather information
 - Younger people
- Targeted educational efforts...

UNDERSTANDING WEATHER INFORMATION

- Watches and Warnings
 - One study: Only 58% correct
 - Older people, higher education levels, and whites more likely to be correct
 - Californians least likely
 - Many believe watch is unimportant and means nothing will happen
 - Naming system issue?
 - Education of the public issue?
- Visual confirmation (watch) error
- Definite severe weather (warning) false alarm
- Warning polygon-still may be small area within polygon
- Educate on what a warning means

WHAT ARE PEOPLE THINKING?

- ◉ Emergency Managers' perceptions...
- ◉ Government decision makers' perceptions...
- ◉ Weather professionals' perceptions...



RISK

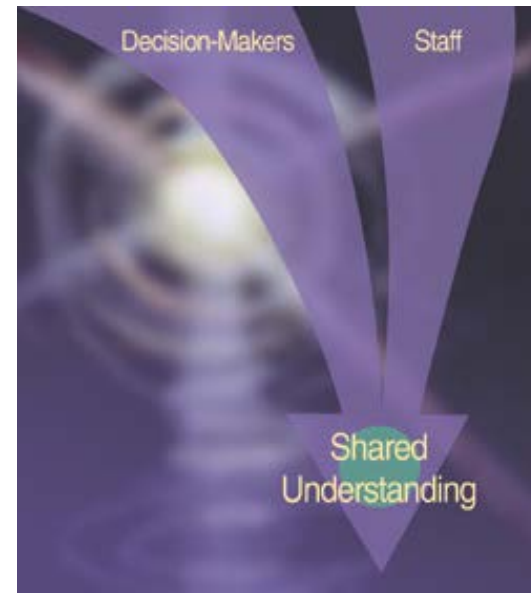
- Condition in which there is a *possibility* that persons or property could experience adverse consequences.
- Who knows the risk?
 - Those with access to data.
 - Those with specialized expertise.
 - Risk analysts
- Risk analysts must convey the risk to decision makers.



CONVEYING RISK TO DECISION MAKERS

○ Risk...

- Likelihood than an event of a given magnitude
- Will occur at a given location within a given time period
- Describe the expected consequences that the event will inflict on persons, property, and social functioning



TIME

- ◉ Amount of time between the detection of the hazard and the onset of exposure
- ◉ Imminent threat: WARNING
- ◉ Long-term potential: Hazard awareness programs which lead to long-term hazard adjustments



COMMUNICATION FLOW OF RISK

- One-way
- Two-way
 - Feedback
- Risk areas
- Vulnerability analysis-populations and property located in those risk areas.



ASSUMPTIONS

- Disseminating scientific information about the hazard agent will motivate people to adopt their protective action recommendations.
- Ignores roles of...
 - The information source
 - Individual differences among message receivers
 - Impediments to information processing
 - Competing demands for attention
 - Cognitive heuristics-processing complex info
 - Conflicts of new information with people's existing beliefs

CLASSICAL PERSUASION MODEL

- Channels
 - TV
 - Radio
 - Phone
 - Internet
 - Face-to-face
 - Social media
- Presentation
 - Verbal (words)
 - Numeric (Numbers)
 - Graphic (Pictures)
- Individual differences among receivers
- This means all modalities must be utilized



PSYCHOLOGICAL CHARACTERISTICS OF RECEIVERS

○ Differences in...

- Perceptions of source credibility
- Access to communication channels
- Prior beliefs about hazards and protective actions
- Ability to understand and remember message content
- Access to resources needed to implement protective action

EFFECTS OF A MESSAGE ON A RECEIVER

- ◉ Attention
- ◉ Comprehension
- ◉ Acceptance
- ◉ Retention
- ◉ Behavioral change



COMMUNICATION NETWORK NEEDED

- ◉ Multiple sources
- ◉ Linked to intermediate sources
- ◉ Who receive information and relay it to the ultimate receivers
- ◉ Demographic differences
- ◉ Psychological differences

twitter

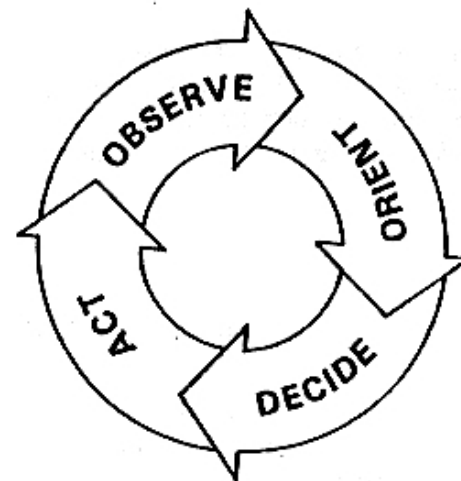
LinkedIn

facebook



PROTECTIVE ACTION DECISION MODEL (PADM)

- Based on...
 - Sensory cues from environment (sights and sounds)
 - Socially transmitted information (disaster warnings)
- Perception of threat that diverts attention from normal activities



PERCEPTION OF THREAT

- ◉ Resume normal activities
- ◉ Seek additional information
- ◉ Pursue protective action
- ◉ Reduce psychological distress



RESPONSE OF AT-RISK PERSON

- The way an individual chooses to respond to a threat depends on evaluations of both...
 - The threat and...
 - The available protective actions.



ENVIRONMENTAL CUES

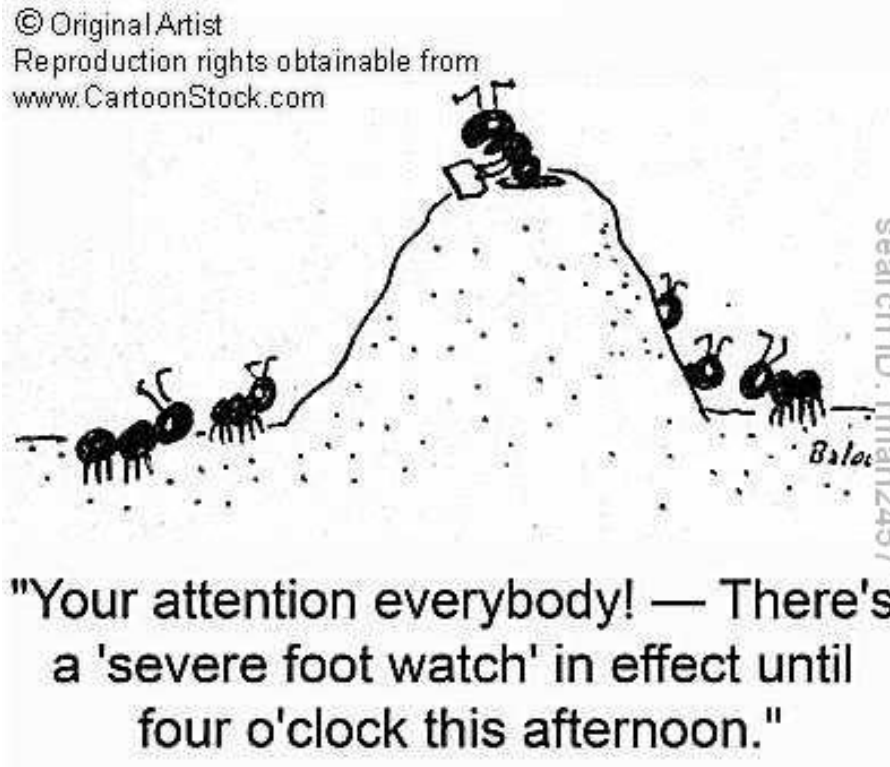
- Experience
- Education
- Knowledge of cues
- Tsunami example



“One helpful strategy is to understand the sources of critical problems, determine the warning cues that hint at the problems, and develop action plans.”

WARNINGS

- ◉ Comprehend?
- ◉ Hearing and understanding
- ◉ Use of technical terms



WARNING STAGES AND ACTIONS: STAGE 1

Risk
identification

- Is there a real threat that I need to pay attention to?
- Threat belief

RISK IDENTIFICATION

- Primary appraisal
- Warning messages from...
 - Authorities
 - News media
 - Peers
- Will it affect me? Threat belief
- People try to maintain their definition of the environment at “normal”

WARNING STAGES AND ACTIONS: STAGE 2



Risk
assessment

- Do I need to take protective action?
- Protection motivation

RISK ASSESSMENT

- Perception of personal risk
- Personalization of risk
- If yes, protection motivation
- Probability and severity
- Immediacy of threat
- Forewarning
- Amount of forewarning affects choice of...
 - Message content
 - Channels feasible for delivery
 - Warning repetition
- Disaster warning versus hazard awareness message
- People will put it off
- Distance from the point of impact
 - Proximity
 - Certainty
 - Complex exposure paths
- Risk=certainty x severity x immediacy
- Some have unrealistic sense of total invulnerability



WARNING STAGES AND ACTIONS: STAGE 3

Protective
action
search

- What can be done to achieve protection?
- Decision set (alternative actions)

PROTECTIVE ACTION SEARCH

- Protective actions:
 - Memory
 - From others
- A decision set of alternatives
- First turn to someone else: government
- Then themselves
- Own knowledge/similar hazards
- Go to external sources
- Observe others
- Reading or hearing from media and peers
- From disaster warnings and hazard awareness programs
- Warning message = guidance on 1 or more protective actions creating a decision set
- Continuing normal activities is always an option

WARNING STAGES AND ACTIONS: STAGE 4

Protective
action
assessment
and selection

- What is the best method of protection?
- Adaptive plan

PROTECTIVE ACTION ASSESSMENT

- ◉ Examining alternatives
- ◉ Is it effective?
- ◉ Fail to take action for many reasons
- ◉ Will not evacuate because of fear of looted property
- ◉ Safety an issue. *Beliefs* about safety...
- ◉ Time requirements-underestimation of time
- ◉ Especially evacuation time

WARNING STAGES AND ACTIONS: STAGE 5

Protective
action
implementation

- Does protective action need to be taken now?
- Threat response

PERCEIVED IMPLEMENTATION BARRIERS

- Resource constraints
 - Lack of knowledge and skill
 - Lack of tools and equipment
 - Lack of social cooperation
- Careless populations
- The elderly
- Special needs populations
- The poor
- Separation of family members
- Perceived cost-gas, food, lodging

PROTECTIVE ACTION IMPLEMENTATION

- ◉ Tend to delay implementation in case they don't need to act
- ◉ Procrastination

You can't escape the
RESPONSIBILITY
of **TOMORROW**



by evading it
TODAY.

— ABRAHAM LINCOLN —

WARNING STAGES AND ACTIONS: STAGE 6

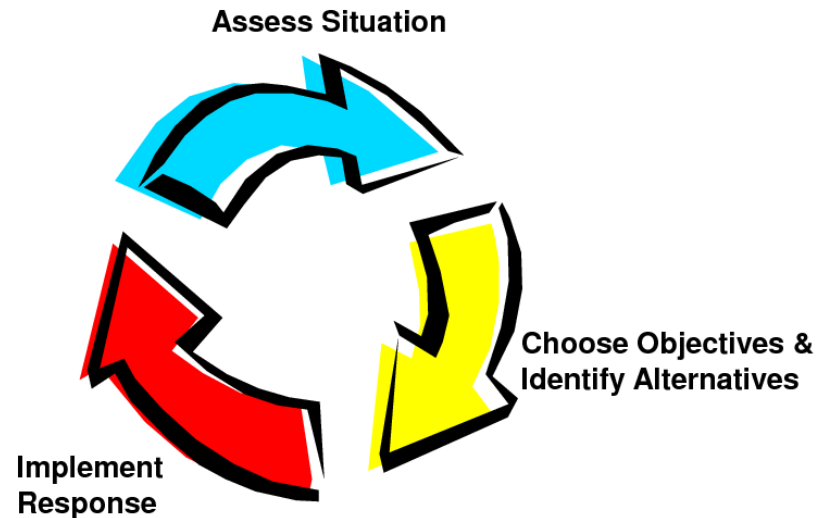
Information
needs
assessment

- What information do I need to answer my question?
- Identified information need

INFORMATION NEEDS ASSESSMENT

- People rarely aware of alternatives available
- Generate an identified information need

Disaster Emergency Needs Assessment



Disaster Preparedness Training Programme

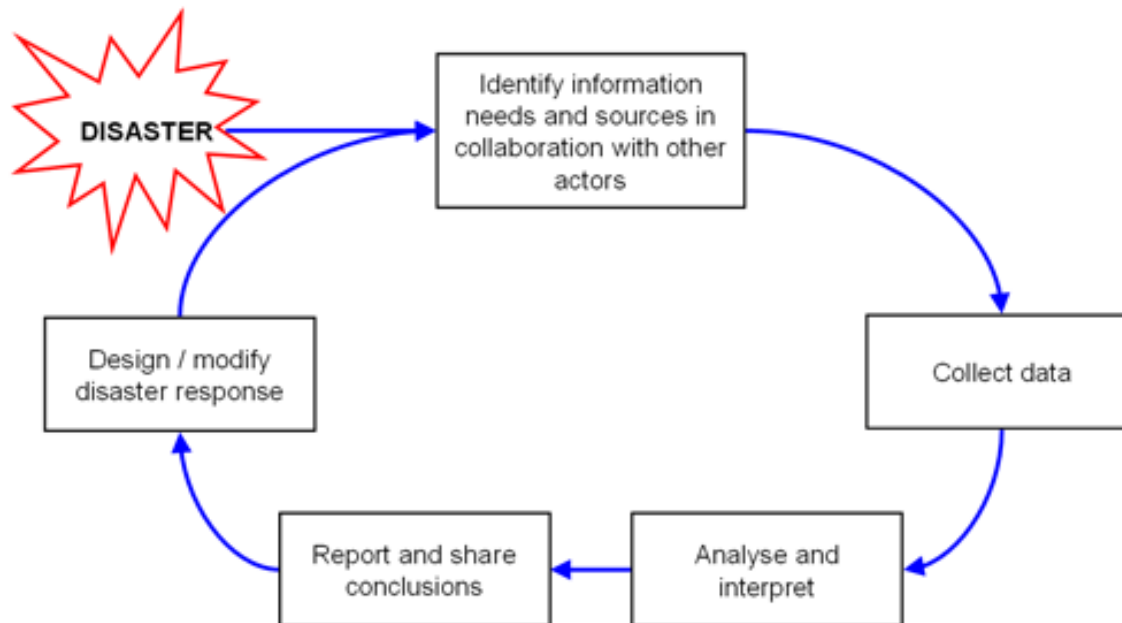
WARNING STAGES AND ACTIONS: STAGE 7

Communication
action
assessment and
selection

- Where and how can I obtain this information?
- Information search plan

COMMUNICATION ACTION ASSESSMENT

- ◉ Information source selection
- ◉ Information channel selection
- ◉ Information search plan
- ◉ News media
- ◉ Need for multiple sources
- ◉ Uncertainties make people turn to their peers
- ◉ Preferred and actual channels



WARNING STAGES AND ACTIONS: STAGE 8

Communication
action
implementation

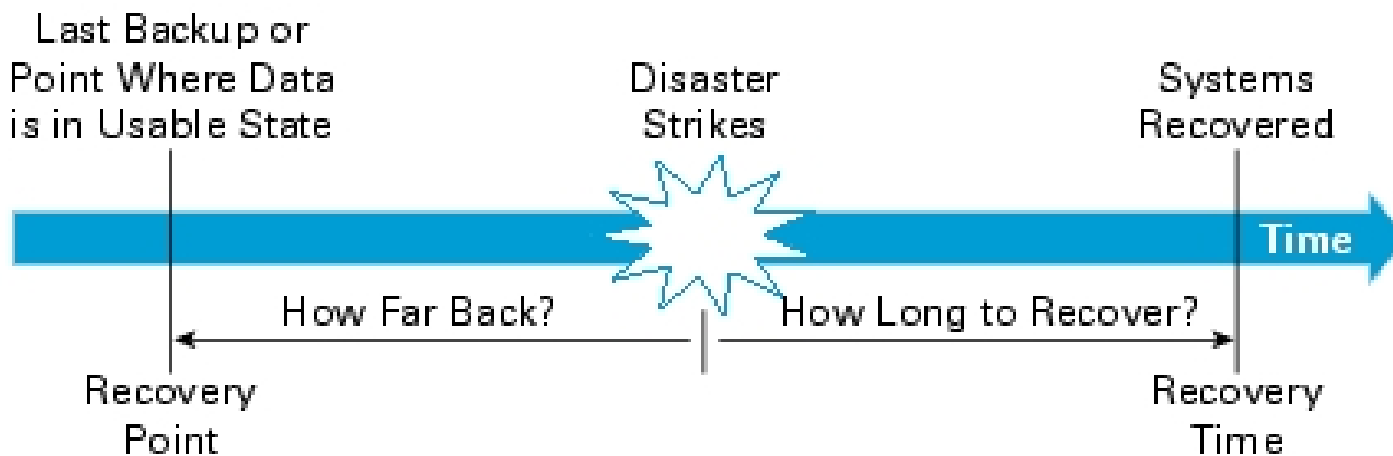
- Do I need the information now?
- Decision information

COMMUNICATION ACTION IMPLEMENTATION

- ◉ Active versus passive monitoring
- ◉ Most appropriate source and channel
- ◉ Success and failure
- ◉ Pessimism
- ◉ Trust issues
- ◉ Warning must be consistent, serious, and simple
- ◉ Denial or panic
- ◉ Perceptions of panic

STRATEGIES

- ◉ Know the community context
- ◉ Racial and socioeconomic differences
- ◉ Channels and sources used
- ◉ Educate children
- ◉ Identify community perceptions
- ◉ What do they understand about hazards and hazard adjustments?
- ◉ Are they ready or are they confused?

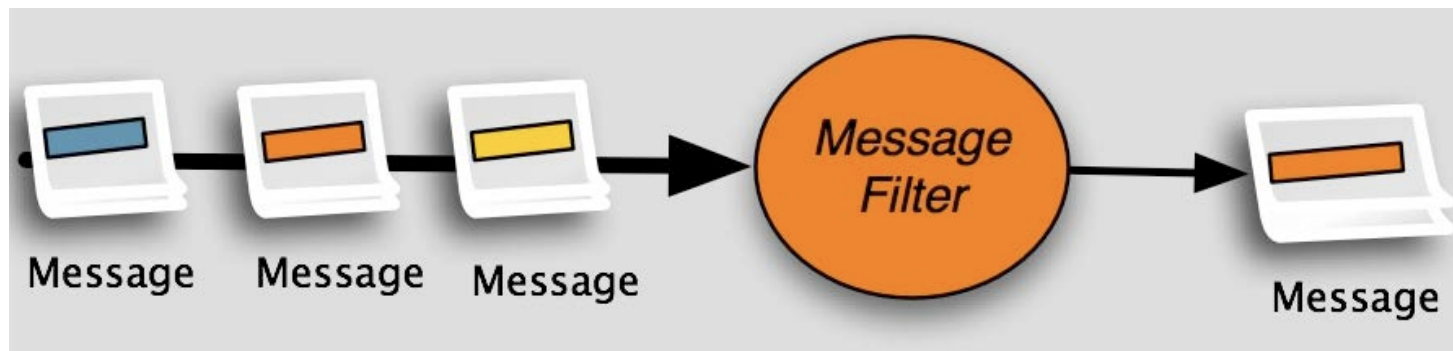


STRATEGIES

- Risk Communication Program
- Educate the public
- Enhance people's sense of self-responsibility
- Identify risk communication sources and channels
- For all segments of community
- Minority and poor issues
- Risk channels
 - Radio
 - TV
 - Web sites
 - Print media
- Regional emergency planning
 - Informal communication networks

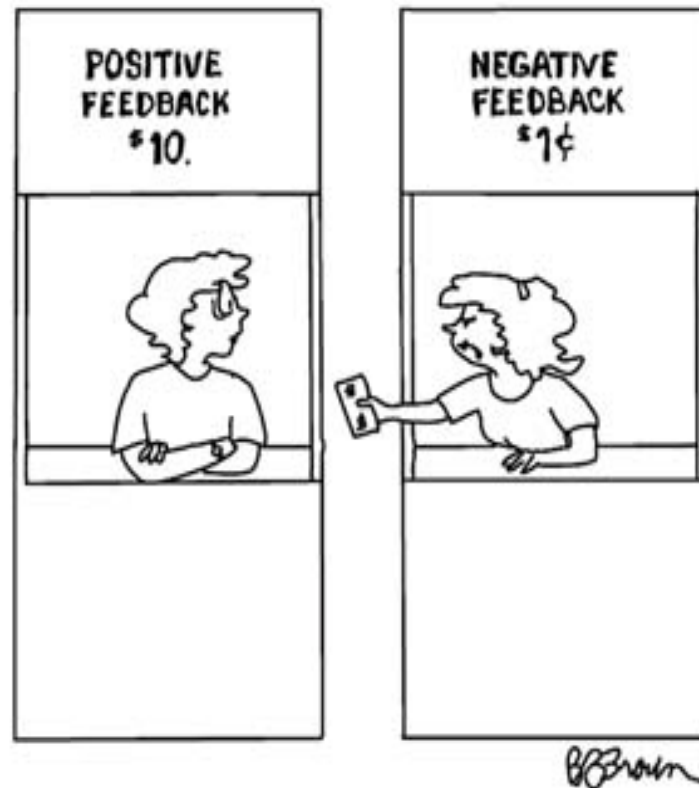
MESSAGE CONTENT

- ◉ Personal risk
- ◉ Personal responsibility for action
- ◉ Guidance for protective action
- ◉ Sources of further information
- ◉ Language!!!!
 - Multilingual



FEEDBACK

- Two-way
- From the public
- Distortion monitoring



"Here! Do me!"

CONCLUSION

- ◉ Q & A
- ◉ Comments
- ◉ Thank you !
- ◉ Dr. Laura Myers
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- ◉ Mississippi State University
- ◉ DrLauraMyers@gmail.com
- ◉ (828) 243-2952

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