## Valley Fever and What Can Be Done About It

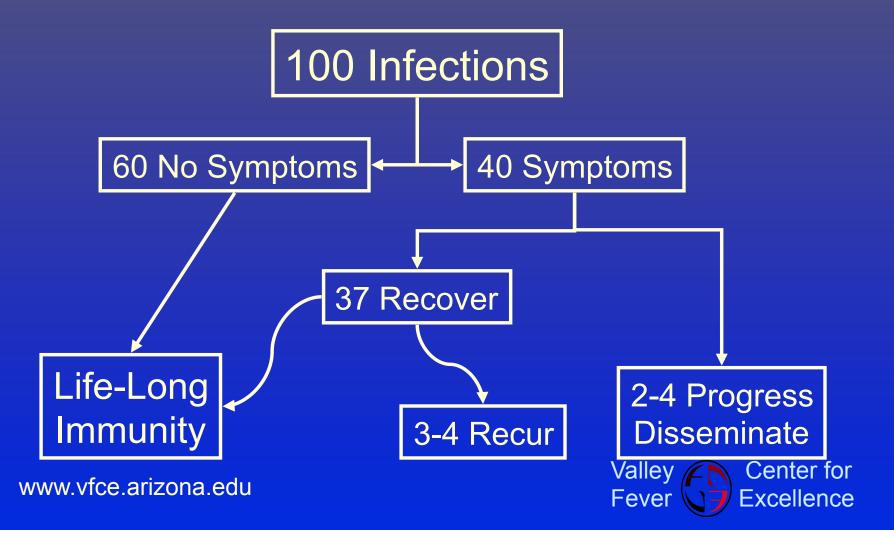
#### John N Galgiani MD www.vfce.arizona.edu

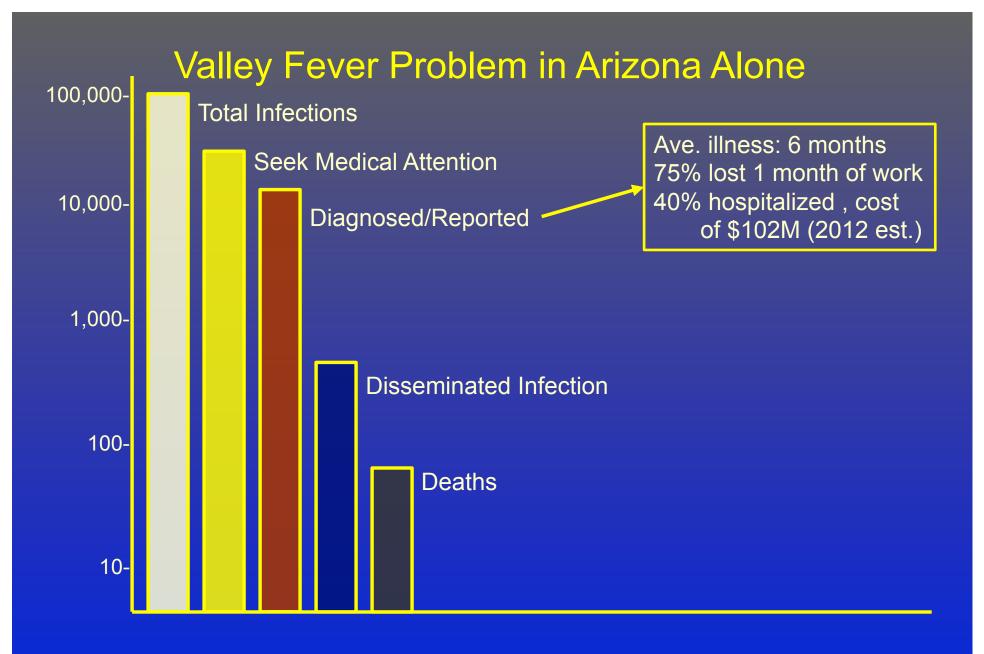


#### Valley Fever is a Western Hemisphere Disease



#### Coccidioidomycosis Spectrum of Disease







## Complications from Valley Fever

#### Pulmonary

- -Diffuse acute pneumonia
  - ARDS
- -Peripneumonic effusion
- -Nodules
- -Cavities
  - Hemoptysis
  - Rupture
- –Chronic firbro-cavitary pneumonia

#### **Disseminated Infection**

- Skin
- Subcutaneous abscesses
- Arthritis
- Osteomyelitis
- Meningitis



### Risk Factors for Complications

#### Pulmonary

- –Diabetes mellitus
- –Cardio-pulmonary or other co-morbidities.
  (Evidence: "common sense").

#### **Disseminated Infection**

- Deficient cellular immunity
- Males > Females
- Racial background
  - African-American
  - Filipino
- Adults > Children
- Pregnancy



## Organizing around Valley Fever in Arizona

1978: Galgiani arrives in Arizona1995: Galgiani goes on a sabbatical1996: Valley Fever Center for Excellence created.

2003: First Arizona Valley Fever Awareness week.



Janice K. Brewer

#### Office of the Governor

#### \* VALLEY FEVER AWARENESS WEEK \*

WHEREAS, Valley Fever infections have tripled in Arizona over the last decade, with 60 percent of all reported cases of Valley Fever in the U.S. occurring in Arizona; and

WHEREAS, Valley Fever is the second most commonly reported infectious disease in Arizona; and

WHEREAS, enhanced surveillance of Valley Fever cases demonstrates the serious impact Valley Fever has on the health of our citizens and on Arizona's healthcare system; and

WHEREAS, the Arizona Department of Health Services, government agencies, businesses, and community organizations are united to educate the public and healthcare providers about Valley Fever in Arizona; and

WHEREAS, research released by the Centers for Disease Control and Prevention and the announcement of a Congressional Task Force brought national attention to Valley Fever; and

WHEREAS, through public education and promoting early diagnosis, the number of individuals impacted by Valley Fever may be reduced; and

WHEREAS, Arizona is the focal point of quality clinical care and research for Valley Fever.

NOW, THEREFORE, I, Janice K. Brewer, Governor of the State of Arizona, do hereby proclaim November 9-17, 2013 as

#### \* VALLEY FEVER AWARENESS WEEK \*

In recognition of the outstanding treatment and research conducted by the Valley Fever Center for Excellence at the University of Arizona, its new clinical center at St. Joseph's Hospital in Phoenix, and for the advances in Valley Fever education and public health by the Arizona Department of Health Services.

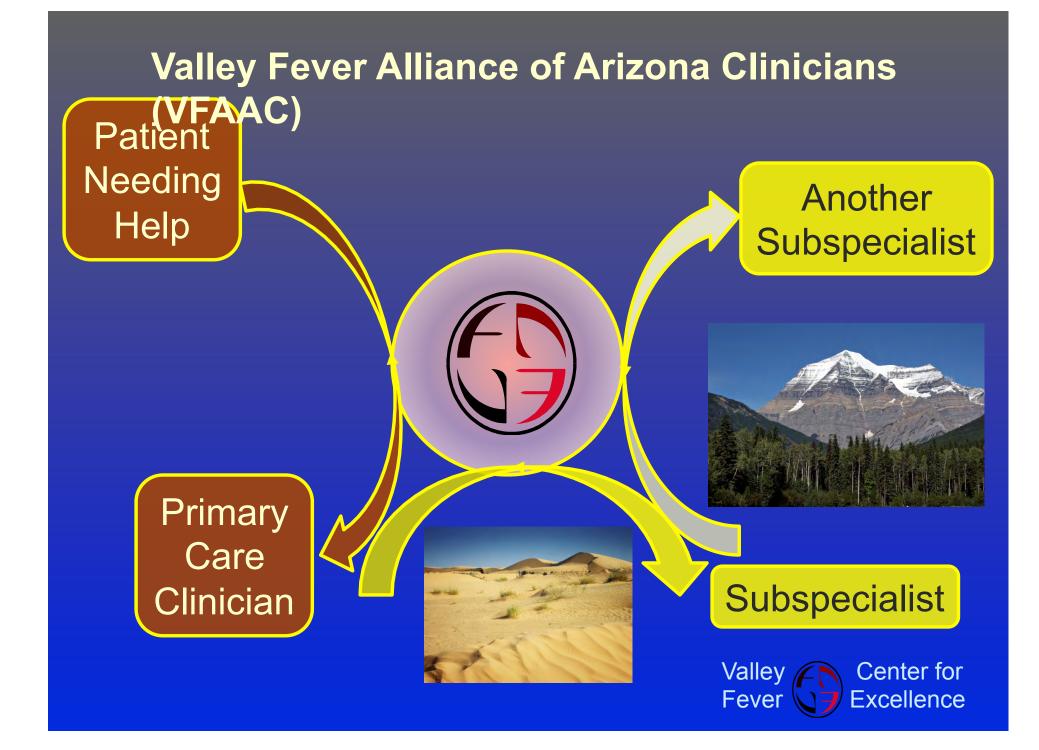
> IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Arizona

anice R. Drewer GOVERNOR

DONE at the Capitol in Phoenix on this twelfth day of September in the year Two Thousand and Thirteen, and of the Independence of the United States of America the Two Hundred and Thirty-eighth. ATTEST.

11<sup>th</sup> Annual Valley Fever Awareness Week November **Oth** \_ 1 2013

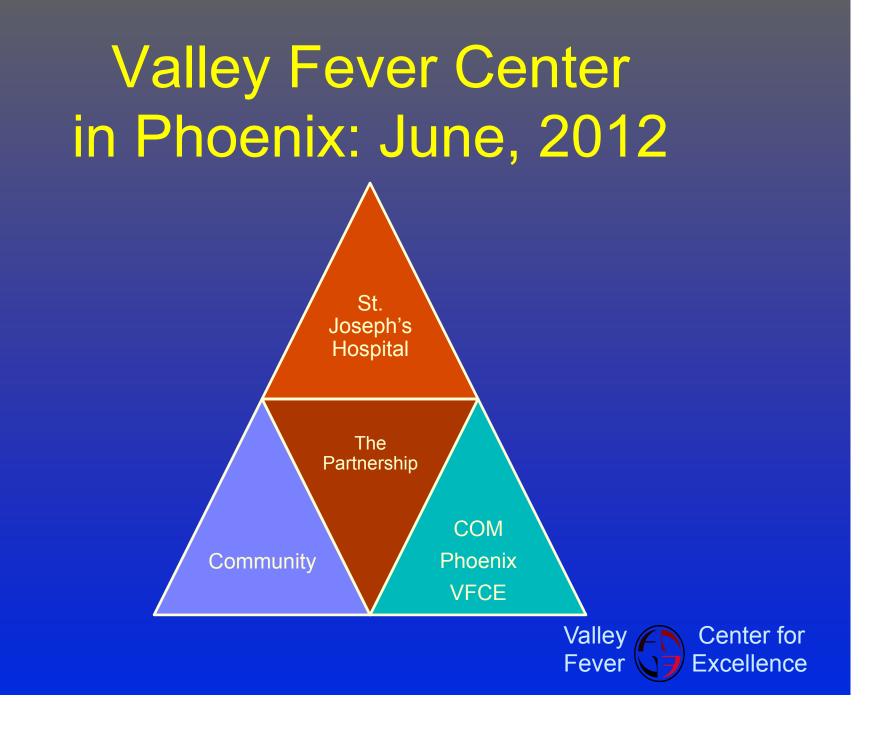




# ARTZONA'S HOME PAGE Valley Fever Center to open in Phoenix

by Ken Alltucker - Oct. 5, 2011 12:00 AM The Arizona Republic





## Valley Fever Center in Phoenix First Year Summary

#### **Source of 420 Inquires**

- 61% Arizona
  - Maricopa (86%)
  - Pima/ Pinal (9%)
- 13% California
- 3% each WA, TX
- 2% each UT, CO, NY
- ≤1% each of 22 states
- Also

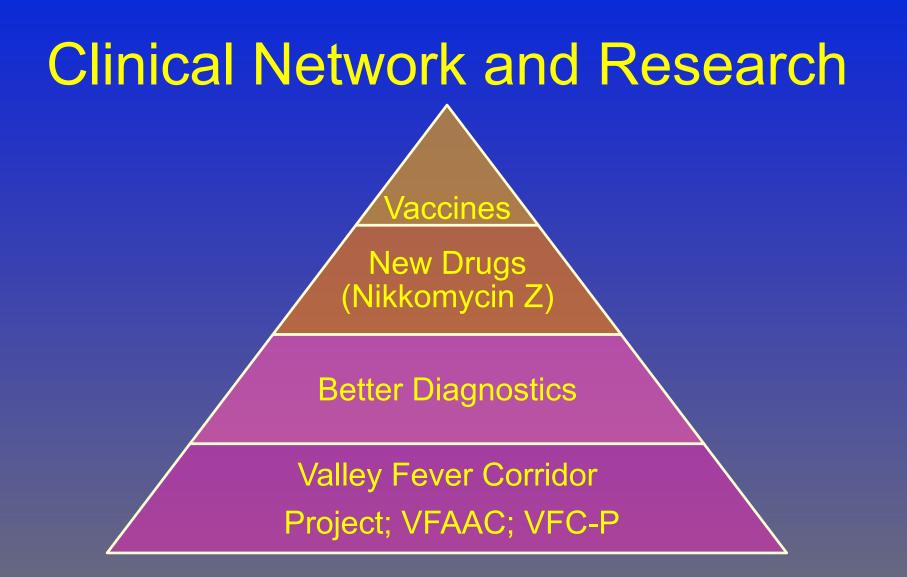
Canada, Australia, Italy, Spain, Argintina **Types of Problems** (132 patients) 25% Valley Fever unlikely or inactive 36% "Mild" Valley Fever pneumonia 22% Complicated Valley Fever pneumonia 15% Disseminated Valley Fever

## Benefits from a VFC in Phoenix

Build on existing expertise

- Doctors across AZ (CA and the rest of the Southwest??) can be part of the VFC/P.
- All clinicians share a common EMR (MobileMD)
- Provide an integrated management plan for the specific needs of each patient.
- Provide case management services to ensure that planned care is provided.







#### **Current Therapy for Valley Fever**

#### **Good News**

 Oral therapy with fluconazole and other azoles are safe and convenient

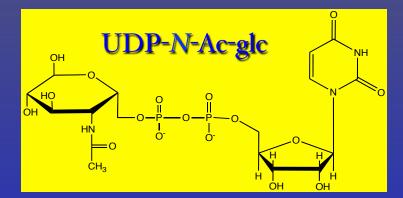
#### **Bad News**

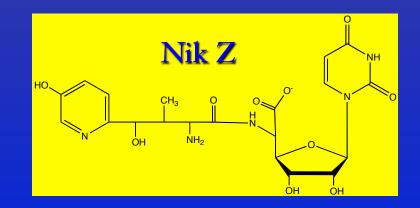
- Not everyone responds to azole treatment (20-40% failure rate)
- Azole drugs do not cure infections
- Relapses when therapy stopped
  - non-CNS: ~30%
  - Meningitis: ~75%



#### Nikkoymcins resemble UDP-Nacetylglucosamine

- UDP-Nacetylglucosamine is a precursor to chitin
- Nikkomycin Z is a competitive inhibitor of chitin synthase







www.vfce.arizona.edu

### Nikkomycin Z: A Possible Cure for Valley Fever

Infection remaining in lungs of mice treated	New paradigm: Complications might be prevented by curing the infection with early treatment.		
<u>with</u>	<u># with Growth</u>	<u># with no Growth</u>	
No Drug	8	0	
or Nikkomycin Z	1	7	
Hector et al, 1990			

## Nikkomycin Z

- 1970s: Discovered by Bayer
- 1980s: Cured mice with Valley Fever
- 1990s: Development started by Shaman Pharmaceuticals

Company went out of business in 2000

- Development stalled because it lacked a new pharmaceutical sponsor Until....
- Acquired by the University of Arizona in 2005



8 years - \$8 million					
NIH	<u>to</u>	from			
'06 Planning	UA	NIH	\$225K		
'07 Analytic services	UA	NIH	~\$400K		
'08 Pre-clinical PK/PD	VFS	NIH	\$850K		
'09 Manufacturing	VFS	NIH	\$3 million		
Philanthropic					
JT Tai & Co Fnd.	UA		\$2.4 million		
<u>FDA</u>					
'07 Clinical trial	UA	FDA	\$1.0 million		
www.vfce.arizona.edu			Valley Center for Fever Excellence		

## Development Restarted by U Arizona

- Phase I multidose
  - NikZ doses versus placebo:
    - 250 mg BID thru 750 mg TID for 14 days
  - Completed in 2009
  - No toxicity to date
  - Pharmacokinetics for comparison with mouse PK/PD studies for future trial design

- 2014: Make drug
- 2015: Phase II
  - 1° pneumonia syndrome
  - 2 treatment groups
    - Placebo (n-25
    - 500 mg TID x 4 weeks
  - Complete 2017



www.vfce.arizona.edu

## Valley Fever Costs to Arizona

Educate Arizona patients and doctors \$100 thousand/year Referral network and case management \$300 thousand/year Diagnostic test development \$1.5 million Nikkomycin Z development \$40-\$60 million

Vaccine development

- -- Protein vaccine: **\$40 M** just to start clinical trials
- -- Live attenuated vaccine: Safety????

Dogs then Humans. \$??

**Doing nothing** 

\$86 million per year just for hospital costs

Valley Center for Excellence

## Thank-you

#### Valley Fever Center for Excellence



College of Medicine



