



CHANGE  
YOUR  
WORLD.

CHARLES  
DARWIN  
UNIVERSITY

# **Healthy Skin Aspirations**

## **Scabies:**

### **Both under recognised and over diagnosed**

Bart Currie

Infectious Diseases Department, Royal Darwin Hospital

Global and Tropical Health Division, Menzies School of  
Health Research at Charles Darwin University

# Scabies Epidemiology

- Endemic in many developing countries
- Endemic in disadvantaged populations in the developed world
- Outbreaks (epidemics) in nursing homes, hospitals, long-term care facilities
- Major animal disease but NOT zoonotic

# Scabies Diagnosis

- Clinical
- Microscopy of skin scrapings (oil, 10% KOH)
- Dermatoscopy (epiluminescence microscopy)  
(x10 – x1000)
- Microscopy of adhesive (“sticky”) tape
- Videodermatoscopy
- Serology under development
- Point of Care PCR or Antigen detection (eg LFI)

# Scabies Diagnosis

- Clinical
- Microscopy of skin scrapings (oil, 10% KOH)
- Dermatoscopy (epiluminescence microscopy)  
(x10 – x1000)
- Microscopy of adhesive (“sticky”) tape
- Videodermatoscopy
- Serology under development
- Point of Care PCR or Antigen detection (eg LFI)



## **Definition of an algorithm for the management of common skin diseases at primary health care level in sub-Saharan Africa**

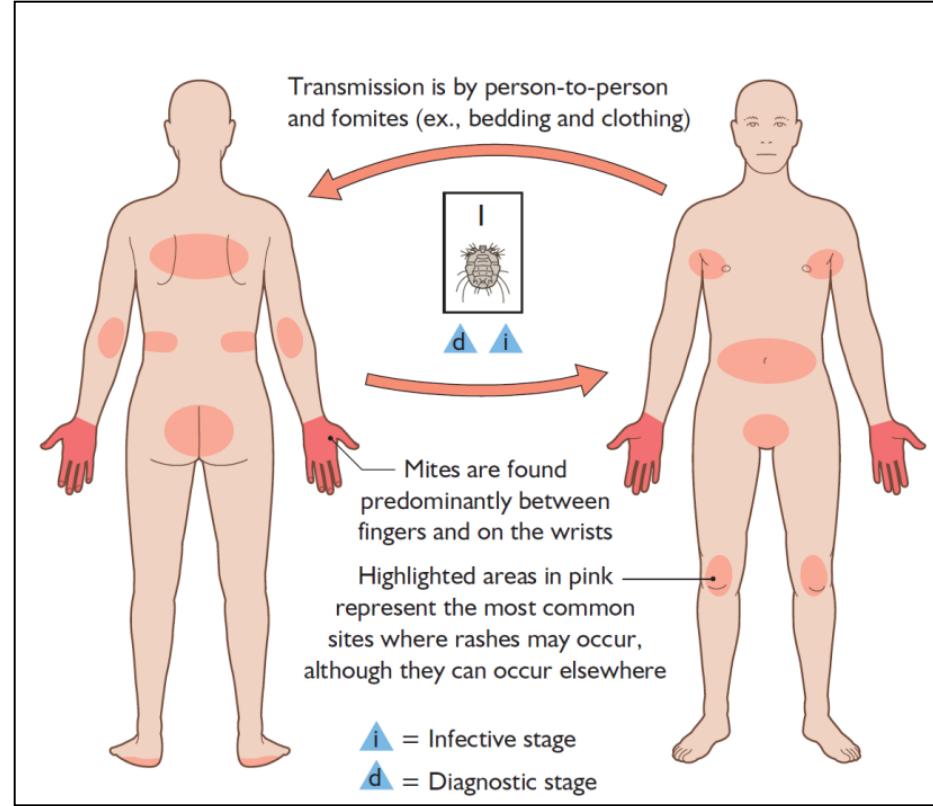
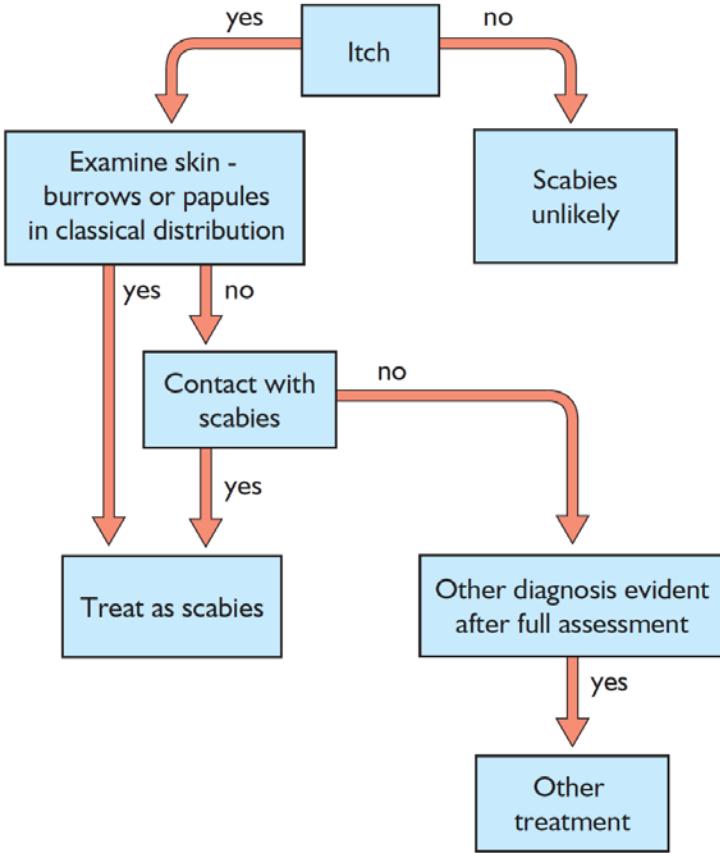
A. Mahé<sup>a,\*</sup>, O. Faye<sup>b</sup>, H. Thiam N'Diaye<sup>b</sup>, F. Ly<sup>a</sup>, H. Konaré<sup>b</sup>, S. Kéita<sup>b</sup>,  
A.K. Traoré<sup>b</sup>, R. Hay<sup>c</sup>

### **Scabies Clinical Definition**

- Presence of itching involving at least two sites of the body
- Visible lesions involving typical sites for scabies
  - Interdigital spaces of hands, wrists, axillae, elbows, knees, buttocks, genitalia in men, breast areolae in women, palms and soles in children aged less than two years
- Presence of others in the same household with itch

**Sensitivity, specificity, PPV & NPV were high for scabies  
Also for pyoderma & mycoses**

# Scabies algorithm for presumptive diagnosis and treatment







16 yo “healthy” male 2015



**69yo male 2015  
COAD**



# Scabies Diagnosis

- Clinical
- Microscopy of skin scrapings (oil, 10% KOH)
- Dermatoscopy (epiluminescence microscopy)  
(x10 – x1000)
- Microscopy of adhesive (“sticky”) tape
- Videodermatoscopy
- Serology under development
- Point of Care PCR or Antigen detection (eg LFI)

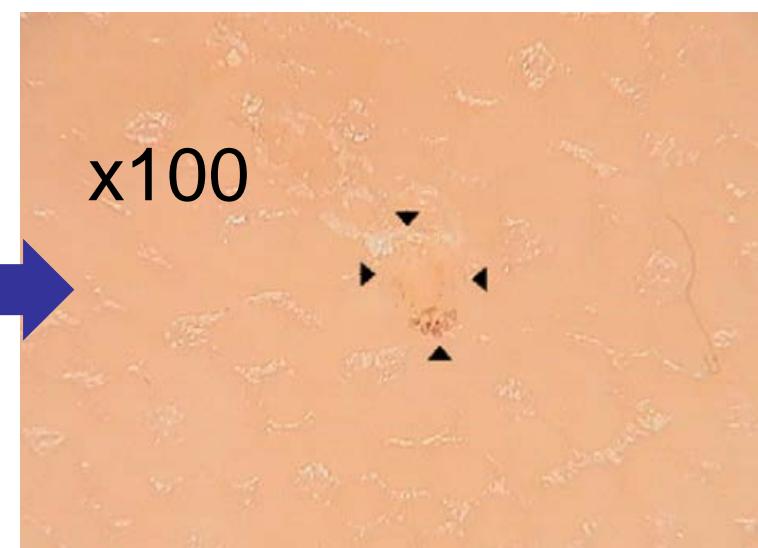
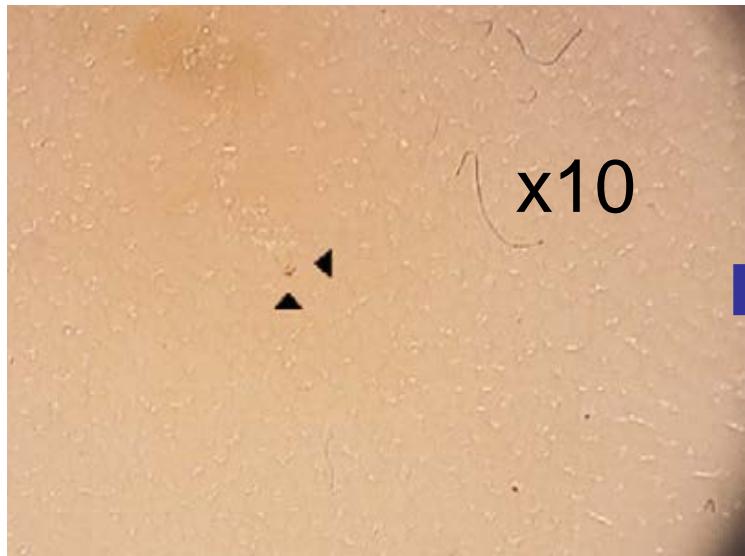
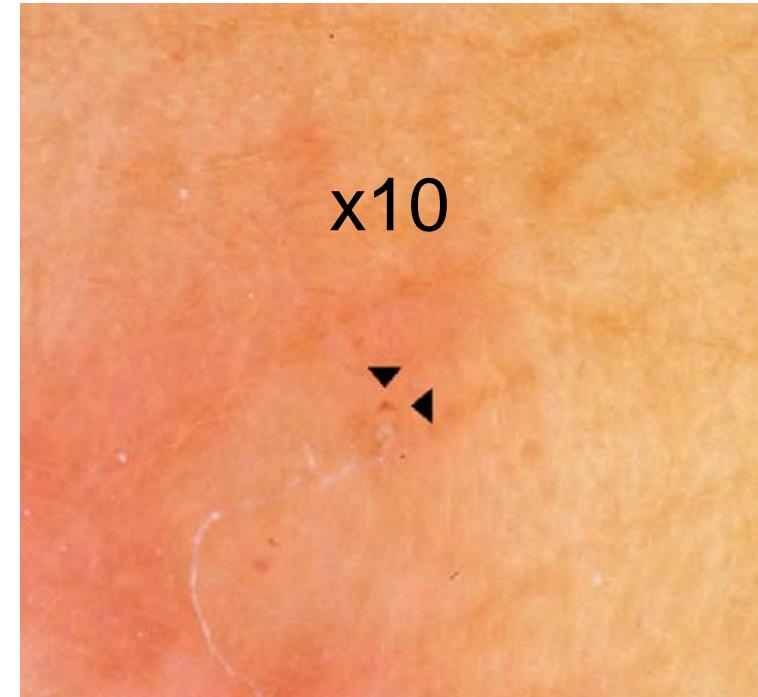
## Accuracy of standard dermoscopy for diagnosing scabies

Alain Dupuy, MD, MPH,<sup>a</sup> Laure Dehen, MD,<sup>b</sup> Emmanuelle Bourrat, MD,<sup>a</sup> Claire Lacroix, PharmD, PhD,<sup>c</sup> Mazouz Benderdouche, MD,<sup>c</sup> Louis Dubertret, MD,<sup>b</sup> Patrice Morel, MD,<sup>a</sup> Martine Feuilhade de Chauvin, MD,<sup>c</sup> and Antoine Petit, MD<sup>b</sup>

*Paris, France*

**Conclusions:** A handheld dermatoscope (x10) is a useful tool for diagnosing scabies, with high sensitivity, even in inexperienced hands. It greatly enhances clinical skills for making treatment decisions.

**Limitations:** There is no definitive standard for ruling out the diagnosis of scabies.  
Specificity (false +ve) issues for beginners



# The Diagnostic Accuracy of Dermoscopy for Scabies

Ju Hyuk Park, M.D., Chul Woo Kim, M.D., Sang Seok Kim, M.D.

*Department of Dermatology, Kangdong Sacred Heart Hospital, Hallym University College of Medicine, Seoul, Korea*

## **Conclusions**

A handheld dermatoscope (x10) is a useful tool for diagnosing scabies, but “extensive training is required to avoid confusion of artifacts” (ie false +ves).

Can direct area for skin scrapings.

Good for “scabies incognito” (eg patient on steroid therapy)

# The Diagnostic Accuracy of Dermoscopy for Scabies

Ju Hyuk Park, M.D., Chul Woo Kim, M.D., Sang Seok Kim, M.D.

*Department of Dermatology, Kangdong Sacred Heart Hospital, Hallym University College of Medicine, Seoul, Korea*



**Fig. 1.** Under 10 $\times$  dermoscopic magnification, numerous hanglider-like triangles indicating the scabies mites' head (arrows) were observed.

# **Comparison of Dermoscopy, Skin Scraping, and the Adhesive Tape Test for the Diagnosis of Scabies in a Resource-Poor Setting**

Birke Walter, MD; Jörg Heukelbach, MD, PhD; Gernot Fengler, MD; Christine Worth, MD;  
Ulrich Hengge, MD, MBA; Hermann Feldmeier, MD, PhD

## **Conclusions**

Combination of dermoscopy and the adhesive tape test is the optimal approach to diagnose scabies in resource-poor settings.

If a trained dermatoscopist is not available, then the adhesive tape test is the method of choice.

Dermoscopy more difficult for dark skin.

# Testing a Test

*Joerg Albrecht, MD*  
*Michael Bigby, MD*

## *Critical Appraisal of Tests for Diagnosing Scabies*

### **Conclusions**

Dermoscopy was not a useful test in the setting studied because it did not significantly increase the posttest probability and PPV was <0.5.

Dermoscopy-guided skin scrapings can help to identify mites previously missed by the naked eye.

Dermoscopy-guided tape testing may be similarly helpful.

# Scabies Diagnosis

- Clinical
- Microscopy of skin scrapings (oil, 10% KOH)
- Dermatoscopy (epiluminescence microscopy)  
(x10 – x1000)
- Microscopy of adhesive (“sticky”) tape
- Videodermatoscopy
- Serology under development
- Point of Care PCR or Antigen detection (eg LFI)



# Scabies Diagnosis

- Clinical
- Microscopy of skin scrapings (oil, 10% KOH)
- Dermatoscopy (epiluminescence microscopy)  
(x10 – x1000)
- Microscopy of adhesive (“sticky”) tape
- Videodermatoscopy
- Serology under development
- Point of Care PCR or Antigen detection (eg LFI)

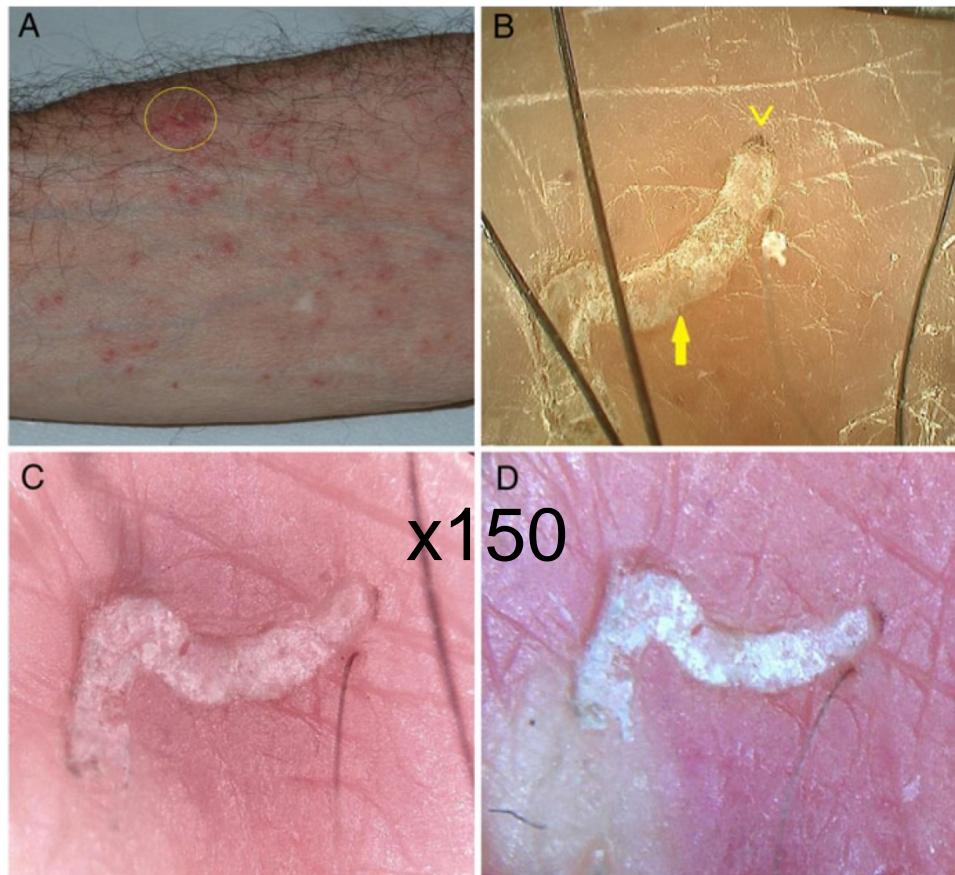
# Videodermatoscopy: Telemedicine application?

Clinical Infectious Diseases Advance Access published November 8, 2014

0 NOVEMBER

## Correspondence

**Low-Cost Equipment for  
Diagnosis and Management  
of Endemic Scabies  
Outbreaks in Underserved  
Populations**



**High  
cost  
\$20,000**

**Low  
cost  
\$30**

# Scabies Diagnosis

- Clinical
- Microscopy of skin scrapings (oil, 10% KOH)
- Dermatoscopy (epiluminescence microscopy)  
(x10 – x1000)
- Microscopy of adhesive (“sticky”) tape
- Videodermatoscopy
- Serology under development
- Point of Care PCR or Antigen detection (eg LFI)

# **Serology for diagnosing scabies: No assay clinically useful as yet**

A diagnostic test for scabies: IgE specificity for a recombinant allergen of *Sarcoptes scabiei*<sup>☆,☆☆</sup>

Rama Jayaraj<sup>a,b</sup>, Belinda Hales<sup>c</sup>, Linda Viberg<sup>a</sup>, Susan Pizzuto<sup>a</sup>, Deborah Holt<sup>a</sup>, Jennifer M. Rolland<sup>d</sup>, Robyn E. O'Hehir<sup>d</sup>, Bart J. Currie<sup>a,e</sup>, Shelley F. Walton<sup>a,f,\*</sup>

<sup>a</sup>Menzies School of Health Research, Darwin, Northern Territory 0810, Australia

Specific IgE antibodies to major scabies antigen Sar s 14.3.

rSar s 14.3-specific IgE quantified using dissociation-enhanced lanthanide fluorescent immunoassays (DELFIA).

Sensitive & differentiated scabies from house dust mite allergy.

**But assay too complex and not reproducible.**

**Diagn Microbiol Infect Dis 2011;71:403-7**

# Scabies Differential Diagnosis

- Impetigo & furunculosis
- Eczema
- Bites from mosquitoes, midges, fleas, lice, bedbugs, chiggers, other mites
- Tinea corporis
- Paronychia
- Papular urticaria & other allergic reactions
- Dermatitis herpetiformis
- Eczema herpeticum

# Crusted Scabies Differential Diagnosis

- Psoriasis
- Skin malignancy – lymphoma, Sezary syndrome
- Tinea corporis and nail tinea
- Syphilis
- Pellagra

# Persistent symptoms despite scabies Tx

- Incorrect initial diagnosis
- Topical scabicide failure – incorrect or inadequate application
- Topical scabicide failure – drug resistance
- Ivermectin failure in crusted scabies – inadequate doses
- Cured but continuing immune response to mite antigen (may be weeks)
- Cured but secondary eczema
- Cured but reaction to topical scabicide
- Reinfestation from untreated contacts or contaminated fomites

# The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

DECEMBER 10, 2015

VOL. 373 NO. 24

## Mass Drug Administration for Scabies Control in a Population with Endemic Disease

Lucia Romani, M.Soc.Dev., Margot J. Whitfeld, M.B., B.S., Josefa Koroivueta, M.B., B.S., Mike Kama, M.B., B.S., Handan Wand, Ph.D., Lisi Tikoduadua, M.B., B.S., Meciusela Tuicakau, M.B., B.S., Aminiasi Koroi, B.A., Ross Andrews, Ph.D., John M. Kaldor, Ph.D., and Andrew C. Steer, Ph.D.



October 30, 2015

RESEARCH ARTICLE

### Impact of an Ivermectin Mass Drug Administration on Scabies Prevalence in a Remote Australian Aboriginal Community

Thérèse M. Kearns<sup>1\*</sup>, Richard Speare<sup>2</sup>, Allen C. Cheng<sup>3</sup>, James McCarthy<sup>4</sup>, Jonathan R. Carapetis<sup>5</sup>, Deborah C. Holt<sup>1</sup>, Bart J. Currie<sup>1</sup>, Wendy Page<sup>6</sup>, Jennifer Shield<sup>7</sup>, Roslyn Gundjirryirr<sup>1</sup>, Leanne Bundhala<sup>1</sup>, Eddie Mulholland<sup>6</sup>, Mark Chatfield<sup>1</sup>, Ross M. Andrews<sup>1</sup>

# **Pyoderma = Skin sores = Impetigo which bacterial species??**



# Streptococcal pyoderma from Gp A streptococcus



# Streptococcal pyoderma from Gp A streptococcus



# Pyoderma: Its not all Gp A streptococcus and the epidemiology is changing



# Community-acquired MRSA



NT CA-MRSA

CC 75

Divergent from others

Usually low virulence

PVL gene -ve

Skin sepsis

# Other skin diseases

# Tinea: *Trichophyton rubrum* dominates









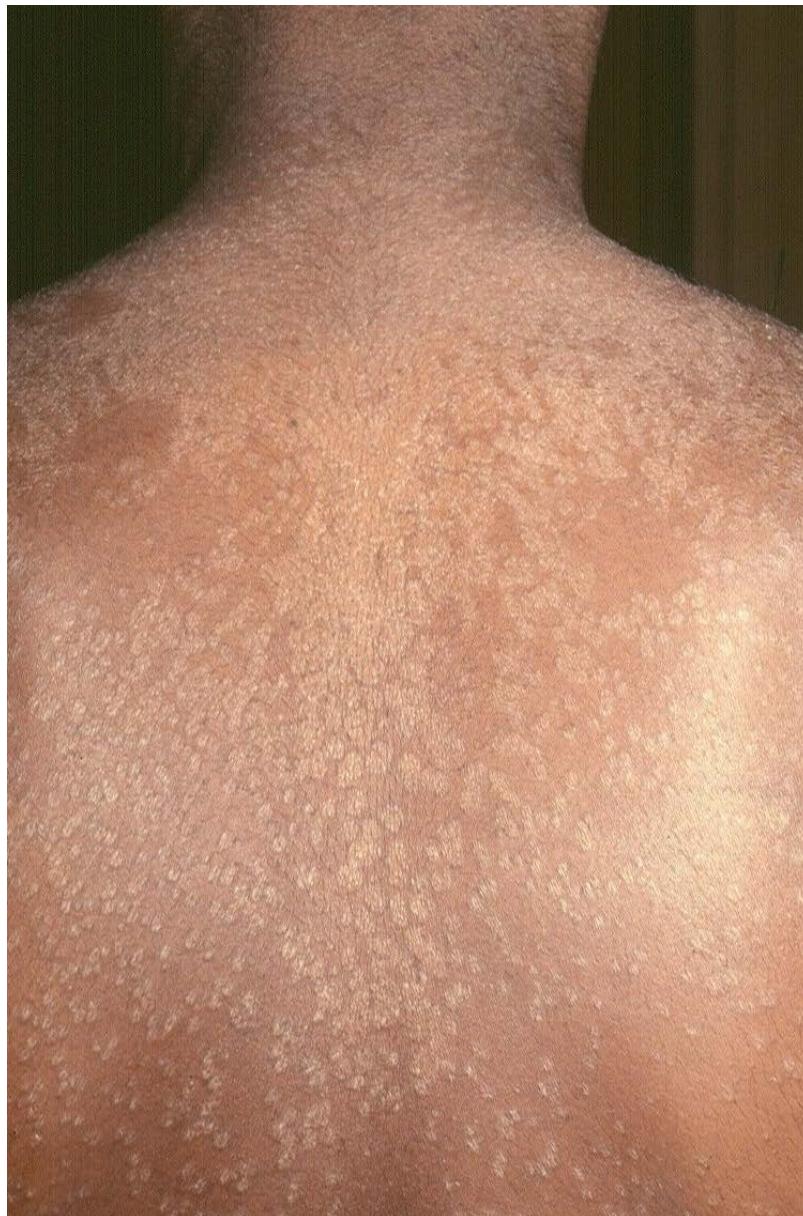








# Tinea: *Malassezia furfur*



# Scabies Acknowledgements

Royal Darwin Hospital  
Infectious Diseases  
Colleagues

Menzies School of  
Health Research

- ☺ Shelley Walton
- ☺ Deb Holt
- ☺ Dave Kemp
- ☺ Pearly Harumal
- ☺ Kate Mounsey

Queensland Institute of Medical  
Research

- ☺ James McCarthy
- ☺ Cielo Pasay
- ☺ Katja Fischer

International Colleagues

- ☺ Olivier Chosidow
- ☺ Rod Hay
- ☺ Ulrich Hengge