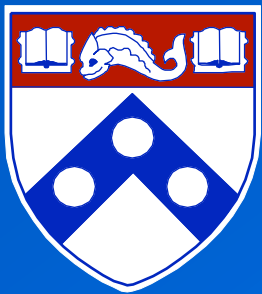


# Major medical co-morbidities of psoriasis : Implications for your clinical practice



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# Disclosure statement

- I have been an investigator and/or consultant for Amgen, Abbott, Centocor, Pfizer, Celgene, Novartis, and Genentech
- I have no significant COI's as defined by the American Association of Medical Colleges (<http://www.aamc.org/research/coi/start.htm>)
- This presentation is the sole work of Dr. Gelfand

# Goals of lecture

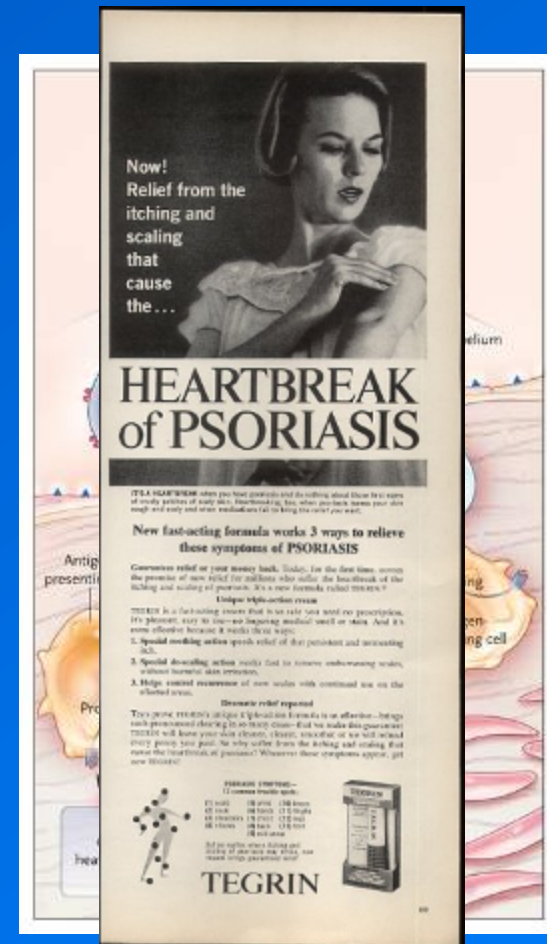
- Describe psoriasis associations with major co-morbidities
- Identify directionality of psoriasis associations with co-morbidities
- Recognize implications co-morbid disease has for the care of patients with psoriasis

# Historical Overview of Psoriasis

Time Period	Psoriasis Theory
BC	Disease often confused with leprosy and described in Old Testament as a condition rendering one unclean. Entity recognized in writings of Hippocrates (400 BC).
1841	Named psoriasis by von Hebra
1963	Van Scott demonstrates epidermal hyperproliferation
1980' s	Immune system emerges as important to pathogenesis of psoriasis
2000' s	Psoriasis is a systemic inflammatory disease?

# Cardiovascular Disease and Psoriasis: How did we get here?

- 1970's: Psoriasis associated with excess risk of CVD (McDonald & Calabresi)
- 1980's: Th-1 inflammation is central to pathogenesis of atherosclerosis and MI



# Psoriasis, inflammation, and CV risk

1. Immune abnormalities are profound
2. Psoriasis severity is associated with greater levels of systemic inflammation (e.g. CRP, Th-1 and Th-17 cytokines)
3. Inflammation may be a common pathway to a variety of diseases including atherosclerosis, obesity, and insulin resistance
4. Psoriasis pathology is unchecked
  - 50% of patients intensively treated continue to have very active disease (PUVA cohort)
  - 75% of patients with severe disease are not receiving appropriate therapies (NPF survey)

# Psoriasis and Co-morbidities Paradigm

## Environmental risk factors

Smoking  
Obesity



## Genes and loci associated with psoriasis, DM and CV diseases

PSORS 2,3,4  
CDKAL1  
ApoE4  
TNFAIP3



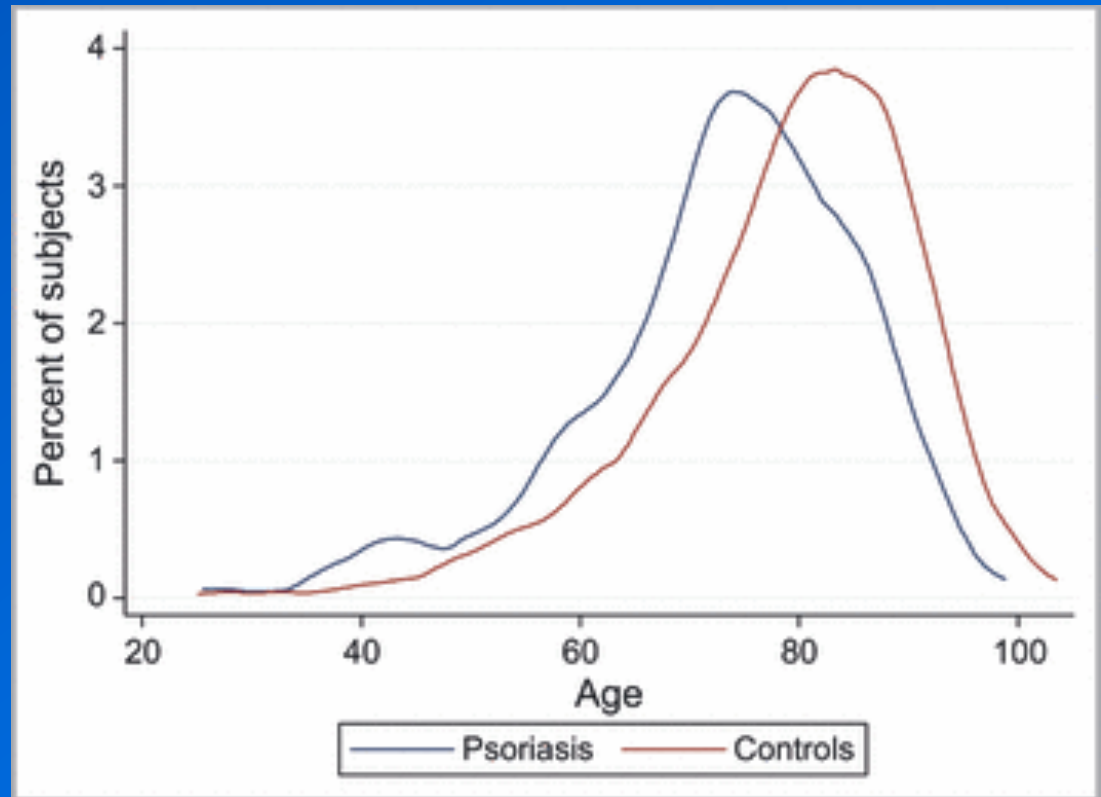
## Mediating Factors

- Pathophysiology
  - Th1/17 inflammation (atherosclerosis, thrombosis)
  - Epidermal proliferation (↑uric acid, oxidative stress)
  - Angiogenesis (endothelial dysfunction)
- Treatment
  - ? Increase CV risk (e.g. CyA, acitretin)
  - ? Decrease CV risk (e.g. methotrexate)
- Psychosocial impact
  - Depression, alcohol and smoking, Lower SES

# Why is this important?

## Severe psoriasis

- 50% increased risk of mortality
- 5 years of life lost
- Top causes of death among severe psoriasis:
  1. CVD (34%)
  2. Infection (22%)
  3. Cancer (21%)



Gelfand JM et al. Arch Dermatology 2007;143:1493-9

Abuabara K, et al. British Journal of Derm. 2010; PMID: 20633008

# New Clinical Care Recommendations

“At the very least, dermatologists, who may be the only health care provider for psoriasis patients, must alert these patients [especially those more severely affected] to the potentially negative effects of their disease as it relates to other aspects of their health.”

*NPF Consensus Statement*

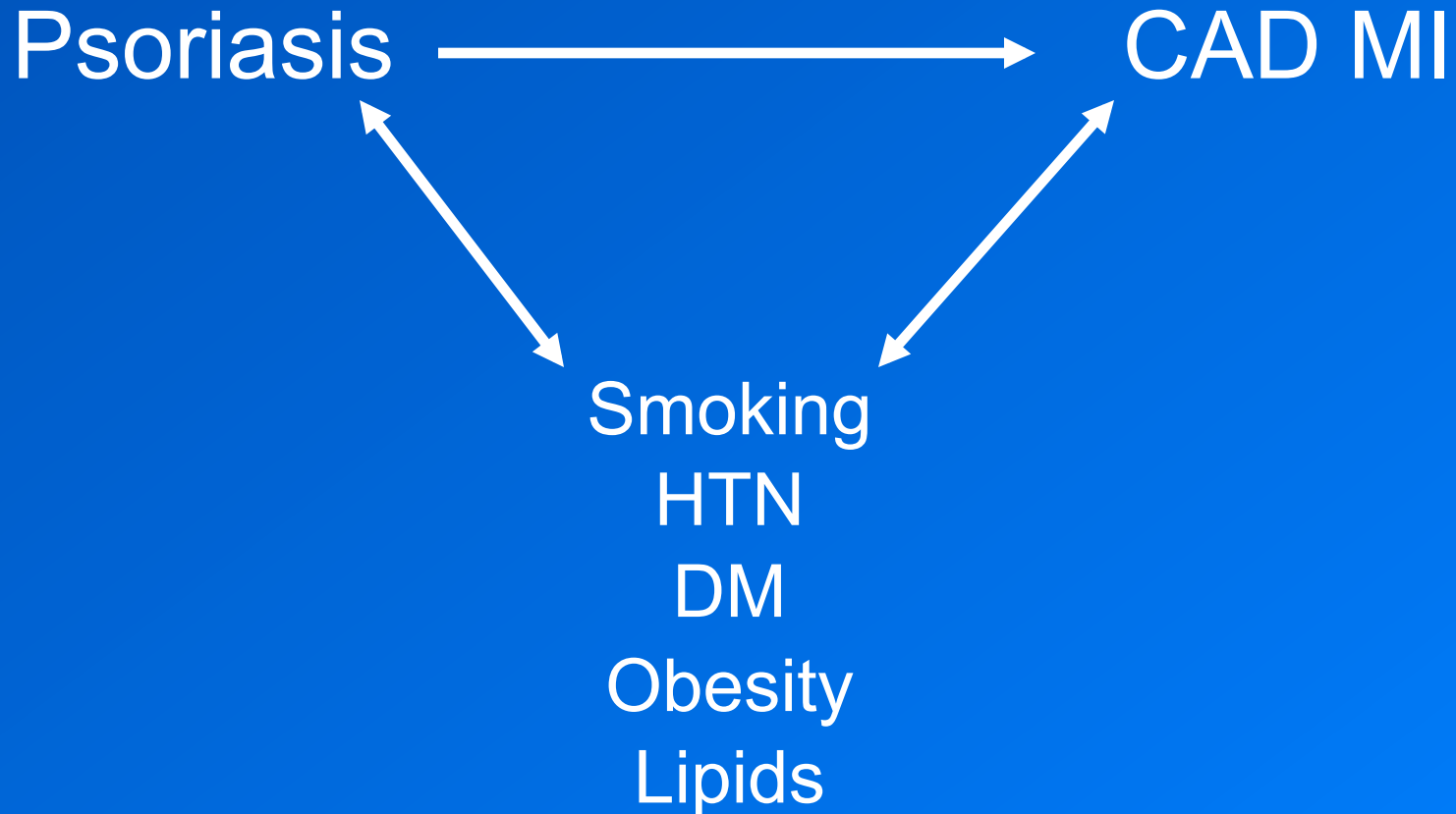
- Moderate-Severe psoriasis: Inform that they may be at increased risk for CAD and they should undergo appropriate medical evaluations
- Mild psoriasis and apparent increased CAD risk factors, such as abdominal obesity or hypertension: Inform that they may be at increased risk for CAD and should undergo medical evaluations.

*American Journal of Cardiology Editor's Consensus*

# Psoriasis is Associated with Cardiovascular risk factors

- Smoking
- Obesity
- Dyslipidemia
- Hypertension
- Diabetes

# Psoriasis: a risk factor for CAD and MI?



# Risk of Myocardial Infarction in Patients With Psoriasis

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**P**SORIASIS IS A COMMON, chronic, immune-mediated disease that affects about 2% to 3% of the adult population.<sup>1,2</sup>

Approximately 6% to 11% of patients with psoriasis also have an associated inflammatory arthropathy (psoriatic arthritis).<sup>3,4</sup> The extent of body surface area affected by psoriasis is variable, ranging from limited disease (<2% body surface area) in approximately 80% of patients to more extensive skin involvement in approximately 20% of patients.<sup>3</sup> Psoriasis has serious impacts on health-related quality of life, even in patients with limited body surface area involvement.<sup>6</sup>

The pathophysiology of psoriasis is characterized by an increase in antigen presentation, T-cell activation, and T-helper cell type 1 (T<sub>H</sub>1) cytokines, resulting in thick scaly red plaques and in some patients, arthritis.<sup>7,8</sup> Psoriasis

**Context** Psoriasis is the most common T-helper cell type 1 (T<sub>H</sub>1) immunological disease. Evidence has linked T<sub>H</sub>1 diseases to myocardial infarction (MI). Psoriasis has been associated with cardiovascular diseases, but has only been investigated in hospital-based studies that did not control for major cardiovascular risk factors.

**Objective** To determine if within a population-based cohort psoriasis is an independent risk factor for MI when controlling for major cardiovascular risk factors.

**Design, Setting, and Patients** A prospective, population-based cohort study in the United Kingdom of patients with psoriasis aged 20 to 90 years, comparing outcomes among patients with and without a diagnosis of psoriasis. Data were collected by general practitioners as part of the patient's medical record and stored in the General Practice Research Database between 1987 and 2002, with a mean follow-up of 5.4 years. Adjustments were made for hypertension, diabetes, history of myocardial infarction, hyperlipidemia, age, sex, smoking, and body mass index. Patients with psoriasis were classified as severe if they ever received a systemic therapy. Up to 5 controls without psoriasis were randomly selected from the same practices and start dates as the patients with psoriasis. A total of 556 995 control patients and patients with mild (n=127 139) and severe psoriasis (n=3837) were identified.

**Main Outcome Measure** Incident MI.

**Results** There were 11 194 MIs (2.0%) within the control population and 2319 (1.8%) and 112 (2.9%) MIs within the mild and severe psoriasis groups, respectively. The incidences per 1000 person-years for control patients and patients with mild and severe psoriasis were 3.58 (95% confidence interval [CI], 3.52-3.65), 4.04 (95% CI, 3.88-4.21), and 5.13 (95% CI, 4.22-6.17), respectively. Patients with psoriasis had an increased adjusted relative risk (RR) for MI that varied by age. For example, for a 30-year-old patient with mild or severe psoriasis, the adjusted RR of having an MI is 1.29 (95% CI, 1.14-1.46) and 3.10 (95% CI, 1.98-4.86), respectively. For a 60-year-old patient with mild or severe psoriasis, the adjusted RR of having an MI is 1.08 (95% CI, 1.03-1.13) and 1.36 (95% CI, 1.13-1.64), respectively.

**Conclusions** Psoriasis may confer an independent risk of MI. The RR was greatest in young patients with severe psoriasis.

JAMA. 2006;296:1735-1741

www.jama.com

# Study Design – data source

- General practice research database (GPRD) is a medical records database established in UK in 1987
- Data is recorded by GP on diagnoses and medications
- Diagnoses and treatments by specialists well captured
- Over 9 million patients and > 40 million person years of follow-up data from 1987-2002
- Use of GPRD has been validated for numerous medical conditions (psoriasis, MI, smoking, and other co-variables)

# Study design

- Study Design: Cohort study
- Age 20-90
- Exposure
  - Psoriasis cohort
    - Mild
    - Severe psoriasis (received systemic or phototherapy)
  - Comparison cohort – no history of psoriasis code matched from same practice and start date

# Characteristics of Study Population

Variable	Control	Mild Psoriasis	Severe Psoriasis
N (%)	556995 (80.96)	127139 (18.48)	3837 (0.56)
Gender			
Male	261023 (46.86)	61100 (48.06)	1869 (48.71)
Female	295972 (53.14)	66039 (51.85)	1968 (51.29)
		P < 0.001	P = 0.011
Age			
Mean (median, 25 <sup>th</sup> , 75 <sup>th</sup> Percentile)	45.72 (42, 30, 60)	46.35 (44, 31, 60)	49.75 (49, 36, 63)
		P < 0.001	P < 0.001

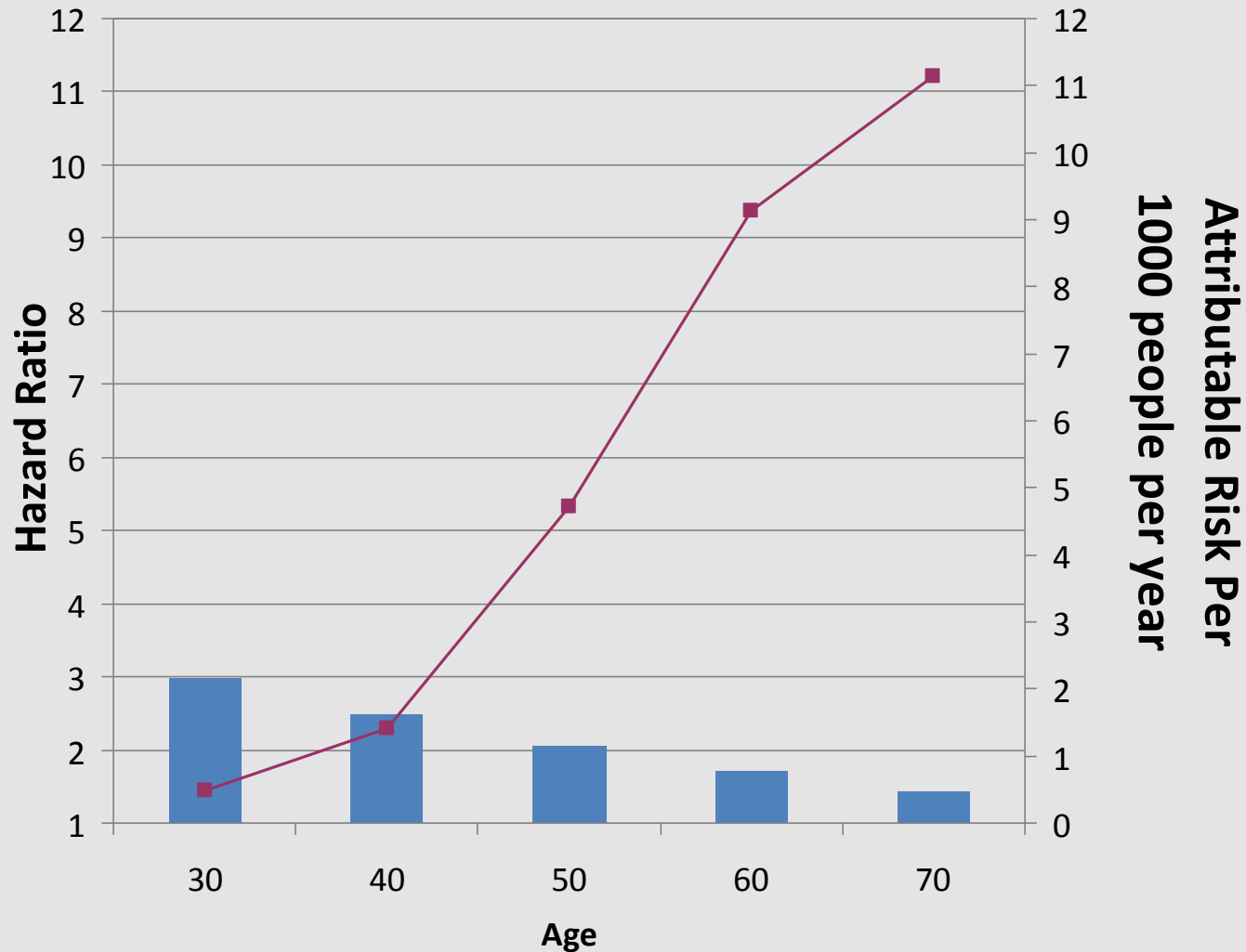
# Adjusted Risk of CV outcomes in patients with psoriasis

Outcome	HR Mild Pso >18	HR Severe Pso >18	HR Severe Pso age 45	HR Severe psoriasis age 65
MI <sup>1</sup>	1.05	1.5	2.4	1.3
Stroke <sup>2</sup>	1.06	1.4	NA	NA
Death <sup>3</sup>	1.0	1.4	2.2	1.6
CV Death <sup>4</sup>	Not done	1.5	2.7	1.9
MACE <sup>5</sup>	Not done	1.5	2.5	1.7

1. Gelfand, JM *et al.* The risk of myocardial infarction in patients with psoriasis. JAMA. 2006;296:1735-1741.
2. Gelfand, JM *et al.* The risk of stroke in patients with psoriasis. J Invest Dermatol 2009; 129:2411-2418.
3. Gelfand, JM, *et al.* The risk of mortality in patients with psoriasis. Arch Derm. 2007;143:1493-1498.
4. Mehta, NN *et al.* Patients with severe psoriasis are at increased risk of CV mortality. Eur Heart J 2010;31:1000-6
5. Mehta, NN, *et al.* Attributable risk estimate of severe psoriasis on major CV events. Am J Med 2011;124:775.e1-6

# Relative risk vs Excess Risk:

The risk of major CV events attributable to psoriasis increases in clinical significance with age



# Psoriasis confers a 0.6% risk per year of MACE

- The yearly excess risk of MACE associated with psoriasis is:
  - 30x greater than the risk of developing melanoma
  - Equivalent to the odds of the Boston Red Sox not making the playoffs on September 2, 2011



# Clinical significance of CV risk for severe psoriasis

- 10 year risk of major CV event attributable to psoriasis= 6%
- Excess risk of death is highest for CV disease (3.5 per 1000 person years)
- 50% of excess mortality in patients with psoriasis is due to CV death

# Sensitivity Analyses

- Information bias
  - Patients seen at least once per year
  - End of observation was last visit to GP
  - Exclusion of PsA, restriction to oral retinoid
- Confounding (external adjustment):
  - Prevalence control 20%
  - OR psoriasis 2.7, OR CV death 6.5
- Directionality of association
  - Excluded patients with h/o CVD
  - Excluded events occurring within the first 6 months
- Treatment effects
  - Exclusion of methotrexate treated patients
  - Exclusion of cyclosporine and retinoid treated patients

# Limitations

- Skin severity not measured directly
- Use of methotrexate in severe group may underestimate the relative risk of MI and other CV outcomes
- Do results generalize to patients with severe psoriasis who do not receive systemic/phototherapy?
- Mechanism not investigated

# Psoriasis whole body inflammation measured by FDG-PET/CT: More than skin deep

- Psoriasis patients demonstrate vascular inflammation equivalent to 2 decades of aging > than controls
- Sub-clinical inflammation in liver and joints observed in patients with normal LFT' s and CRP

# Confirmatory Studies which control for confounding

1. Psoriasis is independently associated with coronary artery disease
2. Psoriasis is independently associated with carotid atherosclerotic disease and impaired endothelial function
3. Moderate to severe psoriasis is independently associated with increased arterial stiffness as measured by pulse wave velocity
4. In patients with PsA, psoriasis severity is an independent predictor of cardiovascular disease
5. “Incident” psoriasis is an independent risk factor for MI primarily in patients <60 with severe disease
6. Psoriasis is an independent risk factor for coronary artery, cerebrovascular, peripheral vascular disease and mortality
7. Psoriasis severity is associated with impaired aortic elasticity
8. Psoriasis duration and severity is associated with carotid atherosclerosis in patients without CV risk factors
9. Young psoriasis patient have increased endothelial cell dysfunction
10. Mild and Severe psoriasis is associated with myocardial infarction in China
11. **Psoriasis is independently associated with increased risk of MI, stroke, and CV death in Denmark**
12. Psoriasis is independently associated with an increased risk of MI in Taiwan
13. Psoriasis is an independent risk factor for MI, stroke, CV death among patients with MI

1. Ludwig RJ Br J Dermatol 2007;156:271-6. 2. Balci DD *et al*, Increased carotid artery intima-media thickness and impaired endothelial function in psoriasis J EADV 2009;23:1-6.
3. Gisondi P, *et al*. Chronic Plaque Psoriasis is associated with increased arterial stiffness. Dermatology 2009;218:110-3. 4. Gladman, DD *et al*. Cardiovascular morbidity in psoriatic arthritis. Ann Rheum Dis 2008.094839 5. Brauchli, YB, *et al*. Psoriasis and risk of incident myocardial infarction, stroke or transient ischaemic attack: an inception cohort study with a nested case-control analysis. BJD 2009;160:1048-1056. 6. Prodanovich, S. Association of Psoriasis with CAD, CVD, PVD and Mortality. Arch Derm. 2009; 145:700-3.
7. Bicer A *et al*. Acta Cardiol 2009;64:597-602 8. El-Mongy . Sub-clinical atherosclerosis in patients with chronic psoriasis: a potential association. J EADV DOI10.1111/j.1468-3083.2009.03481.x 9. Ulosoy RE *et al*. Noninvasive assessment of impaired endothelial cell function in psoriasis Rheumatol Int 2010;30:479-83 10. Xia J *et al* Prevalence of myocardial infarction in patients with psoriasis in central China J EADV 2009;23:1311-15. 11. Ahlehoff, O, Psoriasis is associated with clinically significant CV risk J Intern Medicine 2010; doi:10.1111/j.1365-2796.2010.02310.x 12. Lin HW *et al* Increased risk of acute MI in patients with psoriasis: a 5 year population-based study in Taiwan JAAD 2011;64:495-501 13. Ahlehoff O. Prognosis following first time MI in patients with psoriasis: A Danish nationwide cohort study. J Int Med. 2011; doi: 10.1111/j.1365-2796.2011.02368.x

# Studies that have not confirmed the association

- Psoriasis is not associated with ischemic heart disease hospitalization (HR 1.05 95% CI 0.95-1.17) No difference in severe psoriasis compared to psoriasis treated topically (P=0.10)
  - Wakkee et al. Psoriasis may not be an independent risk factor for acute ischemic heart disease hospitalizations: results of a large population-based Dutch cohort. JID 2010;130:962-7.
- Psoriasis not associated with MI (OR 1.14, 95% CI 0.8-1.6) in outpatient administrative database in Germany
  - Schmitt J and Ford DE. Psoriasis is independently associated with psychiatric morbidity and adverse cardiovascular risk factors, but not with cardiovascular events in a population-based sample JEADV 2010;24;885-92
- Very severe psoriasis is not associated with CV mortality in the PUVA follow up study (HR 1.31, 95% CI 0.90-1.92).
  - Stern RS and Huijbregtse A. Very severe psoriasis is associated with non cardiovascular mortality but not with increased cardiovascular risk. JID 2011;131:1159-1166

# Does Psoriasis Cause CV Disease?

Criteria for causation	Findings from existing studies
Time sequence	Well established
Biologic credibility	Yes
Dose response	Yes, but only a few studies
Consistency of studies	Most studies find an effect
Strength of association	Modest, but clinically important -similar to major CV risk factors HTN, DM
Strength of study design	Cohort Studies –control of confounding, bias, and treatment affects variable

**Answer: Severe psoriasis predicts CVD and death, but more data necessary to prove causal relationship**

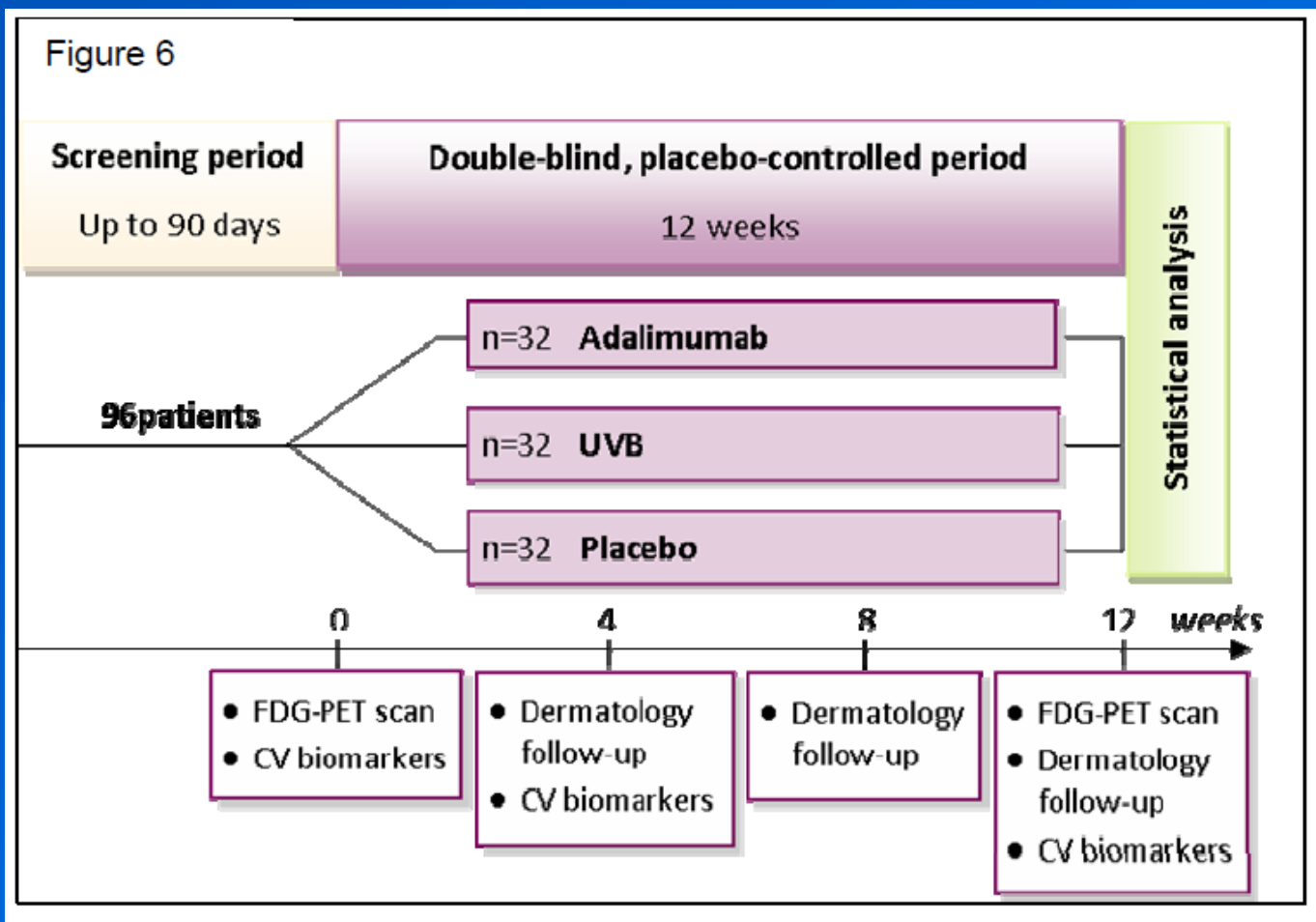
Should psoriasis be aggressively treated to lower the risk of CV disease?

1970

2010

**Answer: We don't know**

# The effect of psoriasis treatment on cardiometabolic disease: RCT



# Clinical Implications: Elevated Cardiovascular risk in severe psoriasis

## Standard Screening Recommendations

- Hypertension – blood pressure at each office visit in patients  $\geq 21$
- Diabetes – Fasting blood glucose q3 years in patients  $\geq 45$  (earlier and more frequent if diabetes risk factors are present)
- Cholesterol – q5 years in patients  $\geq 20$
- **? *More aggressive lipid control***

US Preventative Services Task Force (HTN) 1996  
American Diabetes Association Guidelines 2004  
National Cholesterol Education Program 2001

# More aggressive control of lipids in patients with psoriasis?

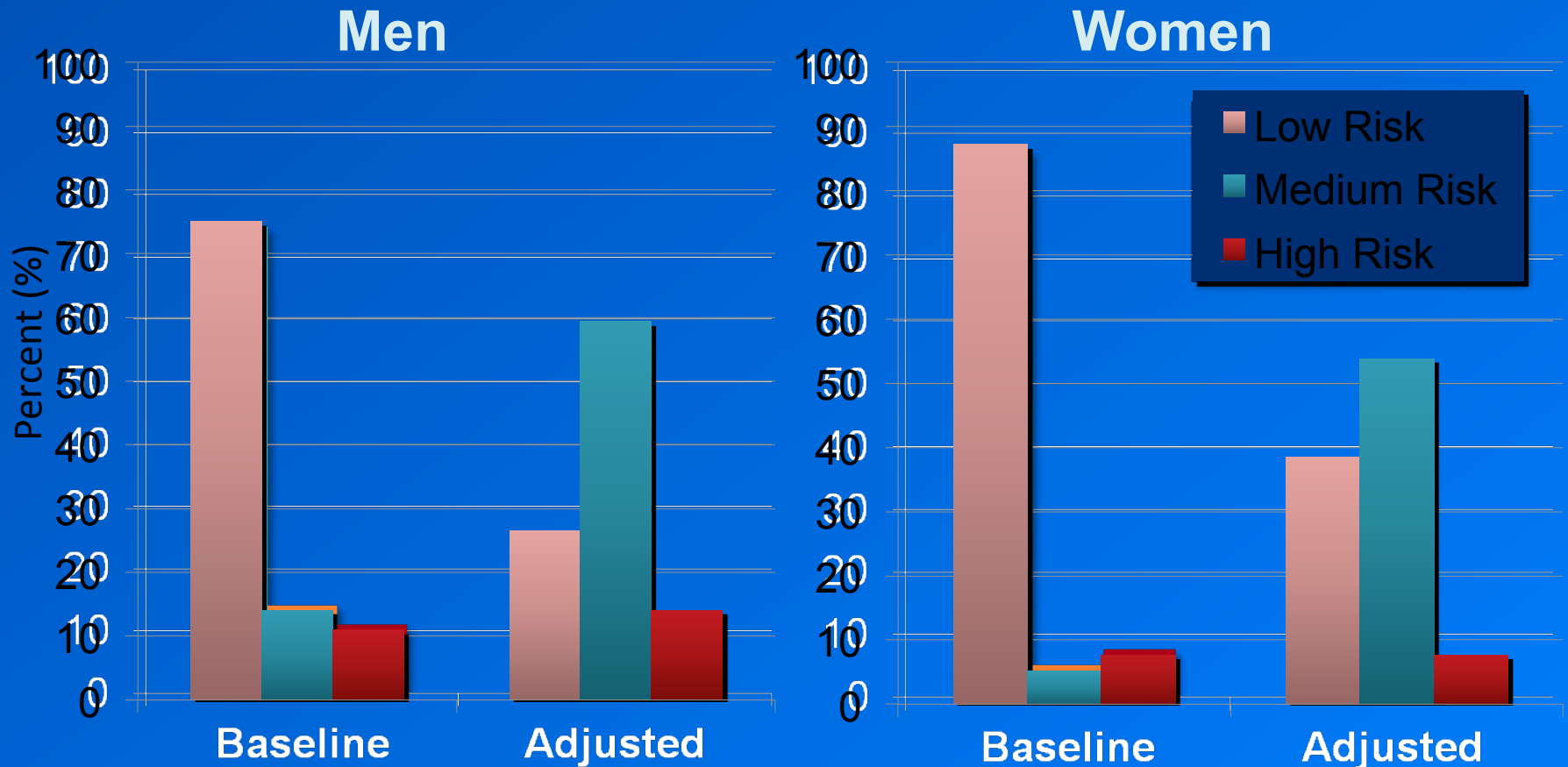
## Recommendations

EULAR evidence-based recommendations for cardiovascular risk management in patients with rheumatoid arthritis and other forms of inflammatory arthritis

M J L Peters,<sup>1</sup> D P M Symmons,<sup>2</sup> D McCarey,<sup>3</sup> B A C Dijkmans,<sup>1,4</sup> P Nicola,<sup>5</sup> T K Kvien,<sup>6</sup> I B McInnes,<sup>7</sup> H Haentzschel,<sup>8</sup> M A Gonzalez-Gay,<sup>9</sup> S Provan,<sup>6</sup> A Semb,<sup>6</sup> P Sidiropoulos,<sup>10</sup> G Kitas,<sup>11</sup> Y M Smulders,<sup>12</sup> M Soubrier,<sup>13</sup> Z Szekanecz,<sup>14</sup> N Sattar,<sup>15</sup> M T Nurmohamed<sup>1,4,13</sup>

- “Risk score models should be adjusted for patients with RA by introducing a 1.5 multiplication factor”
- “Evidence for... PsA is emerging”

# Psoriasis Impacts Risk Classification



# Obesity and Psoriasis

- Obesity may be a risk factor for psoriasis
- 30% of new psoriasis cases are attributable to obesity.
- Psoriasis associated with metabolic syndrome in both children and adults

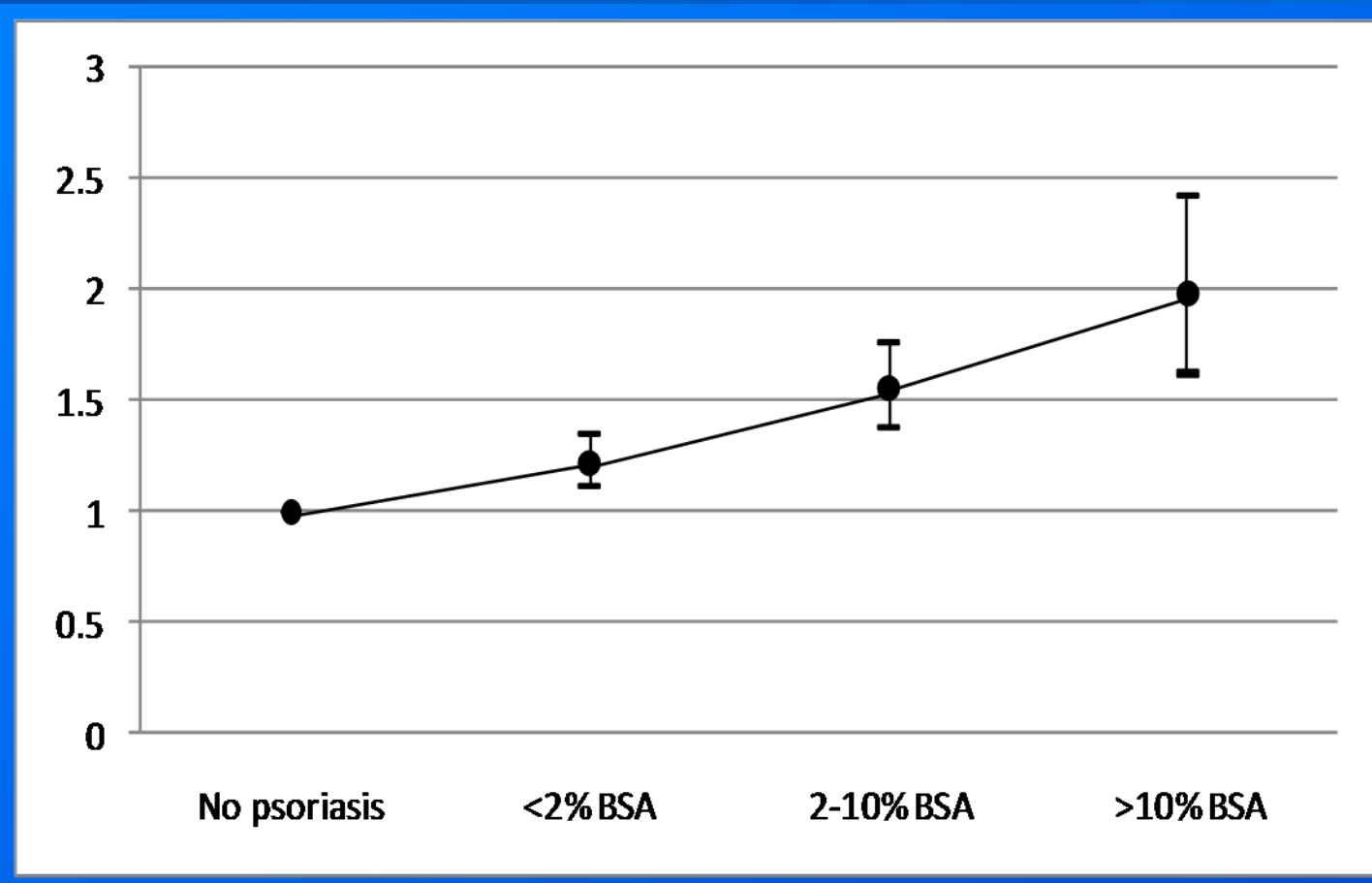
Naldi et al. JID 2005; 125:61-67

Setty et al. Arch Int. Medicine. 2007;167:1670-75

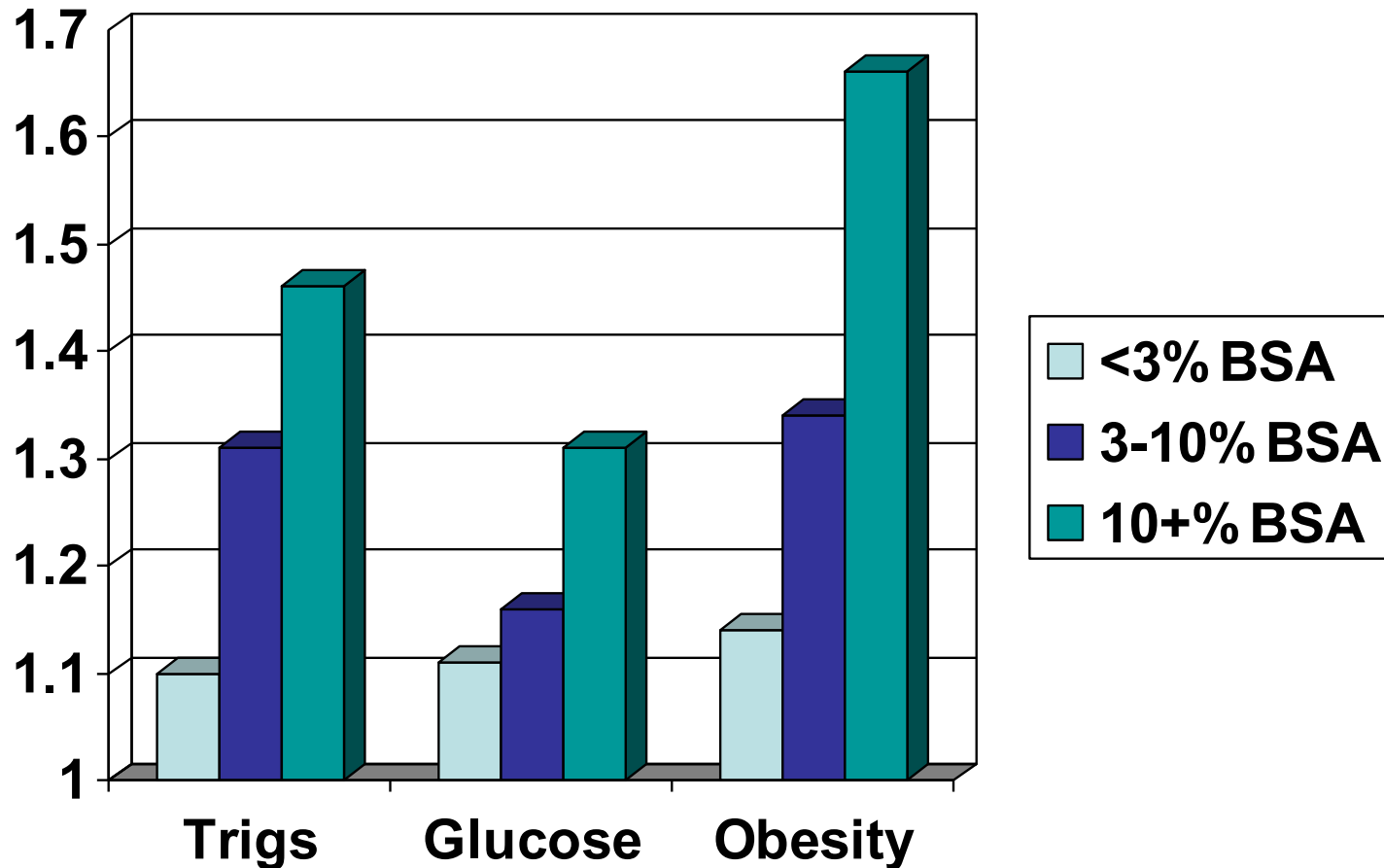
Love JT et al Arch Derm 2010; doi:10.1001/archdermatol.2010.370

Koebnick, C et al. J of Pediatrics 2011.03.006

# Increasing odds of MetSyn with increasing psoriasis extent: N= 4065



# Triglycerides, glucose, and obesity increase in a dose-response manner based on psoriasis severity independent of traditional risk factors



\*Adjusted for age, sex, observation time and other metabolic components

# Impact of Weight on Efficacy of Biologics

Drug	Weight	PASI75 (%)
Infliximab	BMI <25	78
	>30	74
Adalimumab	BMI>30	65
	BMI<25	79
Ustekinumab (45mg)	<100 Kg	74
	>100 Kg	52
Alefcept	<85 Kg	19
	>85 Kg	12
Etanercept (50 qw, 50 biw)	<89 Kg	41, 53
	>89 Kg	25, 43

# Diabetes is independently associated with psoriasis

Model	Mild Psoriasis (95% CI)	Severe Psoriasis (95% CI)
<b>Diabetes</b> Adjusted for age & gender	1.3	1.9
<b>Diabetes</b> adjusted for age, gender hypertension obesity hyperlipidemia smoking	1.1	1.6

Incident diabetes in severe psoriasis\*:  
adjusted OR 2.6 (95% CI 1.1-5.9)

Incident diabetes in Nurses with psoriasis:  
adjusted OR 1.63 (95% CI 1.25-2.12)

Neimann et al. JAAD 2006;55:829-835

Brauchli et al Br J Dermatol 2008;159:1331-7

Qureshi et al Arch Derm 2009;145:379-82

# Obesity, diabetes, metabolic syndrome and psoriasis: Clinical Implications

- Recommend maintenance of normal body weight in those at greatest risk of developing psoriasis (e.g. + FH)
- Screening for diabetes and lipid disorders in patients with psoriasis, particularly when severe
- Altered risk/benefit profile of treatment
  - Decrease efficacy of non-weight based treatments
  - Methotrexate: more aggressive monitoring with liver biopsies

# Smoking and Psoriasis

- Smoking may be a risk factor for psoriasis<sup>1</sup>
  - *Rationale- Nicotine activates dendritic cells, T cells, and Th-1 cytokines*
  - Ex smoker: OR 1.9
  - Current smoker: OR 1.7
  - Pustular psoriasis OR 5.3
- Heavy smoking (>20 per day) associated with more severe psoriasis (OR 2.2)<sup>2</sup>

1. Naldi et al. JID 2005; 125:61-67

2. Fortes et al. Arch Derm 2005;141:1580-84

# Alcohol and Psoriasis

- Excess alcohol intake associated with:
  - Psoriasis, particularly in males
  - More severe psoriasis
  - Treatment noncompliance

# Clinical Implications: Psoriasis and Smoking/Alcohol

- Smoking
  - cessation particularly for those with pustular disease
  - smoking avoidance in people at risk for psoriasis (e.g. + FH)
- Alcohol
  - a marker for treatment failure/non-compliance
  - Alcohol use alters risk/benefit profile of treatments
  - Example: RCT demonstrates that etanercept increases risk of all cause mortality and serious infections in patients with moderate to severe alcoholic hepatitis

# Cancer and Psoriasis

- Cancer is of concern due to chronic use of immunosuppressive therapies, co-morbid behaviors, and chronic inflammation
- Patients with severe psoriasis 41% more likely to die of cancer (4<sup>th</sup> highest excess risk)
- Cancer of lung, liver, pancreas, breast, colon, bladder, and kidney have been inconsistently associated with psoriasis
- Lymphoma has been of special concern

Neimann et al. Expert Review of Dermatology. 2006;1:63-75

Abuabara K, et al. British Journal of Derm. 2010; PMID: 20633008

# Does psoriasis itself increase the risk of lymphoma?

- Conflicting results
- Unclear degree to which psoriasis and/or its treatment increases lymphoma risk
- Strong association of psoriasis with CTCL

Study	All Lymphoma	T-Cell Lymphoma	Hodgkin's Lymphoma	Non-Hodgkin's Lymphoma
Positive Association	6 +	5 +	2+	4+
Not associated	2 -		5-	5 -

# Clinical Implications: Psoriasis and Lymphoma

Consider biopsy in severe disease, treatment failures

*CTCL may progress rapidly with immuno-suppression*

# Clinical Implications

- Always consider a skin biopsy in patients with atypical features of psoriasis and/or those not responding to treatment
- ***Encourage patients to stay up to date on age appropriate cancer screening***
  - Cervical cancer: Pap smear (q 2-3 yrs ages 21-70)
  - Breast cancer: mammography (50-74, q 2 yrs)
  - Colon cancer: (50-75) fecal occult blood q year, flex sig q5 yrs, colonoscopy q10 yrs)
- Large, long-term follow up studies necessary to determine risk of cancer with psoriasis treatments

CDC guidance accessed 9/10/10

Note: Earlier Screening recommended in those at high risk

# Infection and Psoriasis

- Streptococcal pharyngitis a risk factor for guttate psoriasis
  - Molecular mimicry of streptococcal M peptides and human keratins
- HIV a risk factor for severe psoriasis
  - HIV may act as superantigen in the activation of T cells
- Patients with severe psoriasis 65% more likely to die of infection (second highest excess risk)

# Clinical Implications: Psoriasis and Infection

- Screen for Streptococcal infection with guttate flares
- Screen for HIV in severe psoriasis
- ***Vaccination*** for
  - influenza (annually)
  - pneumonia
  - zoster (age 60)
  - hepatitis B
  - HPV (ages 9-26)

# Psoriasis and mood disorders: qualitative data

“Only psoriasis could have taken a very average boy...and made him into a prolific, adaptable, ruthless-enough writer”

# Psoriasis and mood disorders: qualitative data

- **Stalin was successfully treated with “lysates” by Dr. Kazakow**
- **Stalin closed the State Institute of Skin and Venereal Diseases in favor of a new institute for Dr. Kazakow to study lysate therapy**
- **Stalin’s psoriasis relapsed**
- **Dr. Kazakow was tried and executed**

# Psoriasis and mood disorders: quantitative data for function

QOL outcome was SF-36 physical and mental health domains

	Mental Functioning
Healthy adults	53.43
Diabetes type 2	51.90
Myocardial infarction	51.67
Congestive heart failure	50.43
Arthritis	48.81
<b>Psoriasis</b>	<b>45.69</b>
Lung disease	44.47
Depression	34.84

	Physical Functioning
Healthy adults	55.26
Depression	44.96
Arthritis	43.15
Myocardial infarction	42.64
Lung disease	42.31
Diabetes type 2	41.52
<b>Psoriasis</b>	<b>41.17</b>
Congestive heart failure	34.50

# Psoriasis and Mood Disorders: Clinical Outcomes Data

Outcome	Hazard Ratio	Extra cases associated with psoriasis per year in UK
Depression	1.4	10,400
Anxiety	1.3	7,100
Suicidality	1.44	350

# Psoriasis and mood disorders: Clinical Implication

- Ask about depression and anxiety symptoms and monitor impact of treatment on psychiatric symptoms
- Refer for treatment as appropriate
- Some data to suggest that cognitive-behavioral therapies and meditation may modestly enhance response to psoriasis treatments

Kabat-Zinn J, *et al.* Psychosomatic Medicine 1998; 60: 625-632.

Zachariae R, *et al.* J Am Acad Dermatol 1996; 34: 1008-15

# Psoriatic Arthritis and Psoriasis

- Prevalence of PsA varies by BSA
- PsA generally occurs after onset of psoriasis
- PsA may be progressive and can cause permanent joint damage
- C-RP and # of joints involved are markers of progression

<b>Strata</b>	<b>Prevalence 95% CI</b>
All psoriasis	11% (9, 14)
No, little psoriasis	6% (4, 10)
1-2 % BSA	14% (9, 21)
3-10% BSA	18% (10, 28)
10+% BSA	56% (34, 76)

# Clinical Implications: Psoriasis and PsA

## Identify symptoms/signs of psoriatic arthritis

- Morning joint stiffness
- Joint pain that improves with activity
- Swollen, tender joints, dactylitis, enthesitis
- Check X rays of affected joints and CRP

# Treatments which are effective for Pso and PsA

Drug	DMARD?	PASI75 (Drug–PBO)	ACR20 (Drug–PBO)
Adalimumab	Yes	40 qow 49% <sup>5</sup>	44% <sup>7</sup>
Etanercept	Yes	50 qw,biw 30% 45% <sup>5</sup>	44-60% <sup>6</sup>
Infliximab	Yes	77% <sup>5</sup>	47-55% <sup>6</sup>
Golimumab	Yes	37% <sup>10</sup> *	42% <sup>10</sup>
Methotrexate	Yes	60% (no pbo) <sup>1</sup>	NA
Leflunamide	Yes	9.6% <sup>4</sup> *	16.3% (N=186) <sup>4</sup>
Cyclosporine	Yes	71% (no pbo) <sup>1</sup>	NA **
Acitretin	?	34-52% <sup>2</sup>	NA **
Ustekinumab	?	45mg 63% 90mg 72% <sup>9</sup>	28% <sup>8</sup> **
Alefacept	?	20%	31 (week 24) <sup>3</sup> **

<sup>1</sup> Heydendael, V, et al. NEJM. 2003;349:658-665

<sup>2</sup> Geiger, JM. Skin Therapy Letter. 2003;8:1-3

<sup>3</sup> Mease, et al. Arthritis Rheum. 2006;54:1638-45

<sup>4</sup> Kaltwasser JP. Arthritis Rheum. 2004;50:1939-50

<sup>5</sup> Kurd, S. Exp. Rev. Clin Immunol. 2007; 3:171-5

<sup>6</sup> Woolacott, NF. Clin Exp Rheum. 2006;24:587-593

<sup>7</sup> Mease, PJ. Arthritis Rheum. 2005;52:3279-3289

<sup>8</sup> Gottlieb, A, et al. Lancet 2009;373:633-40

<sup>9</sup> Papp KA, et al. Lancet 2008;371:1675-84

<sup>10</sup> Kavanaugh, A. Arth Rheum 2009;60:976-86

**Not FDA approved for:**

**\* Psoriasis**

**\*\* Psoriatic arthritis**

# Conclusion

- Evolving literature identifying:
  - Environmental Risk Factors for psoriasis
  - Diseases which may occur as a consequence of chronic psoriasis
- More research needed to determine how psoriasis treatment increases or decreases the risk of metabolic, cardiovascular, psoriatic arthritis, and cancer outcomes
- Important implications for the management of psoriasis

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