Non-melanoma skin cancer and UV light

Rosemary Nixon AM

BSc(Hons) MBBS MPH FACD FAFOEM

Dermatologist & Occupational Physician

Clinical Associate Professor, Monash University and the University of Melbourne

Occupational Dermatology Research & Education Centre

Skin & Cancer Foundation Inc, Carlton, Vic

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Epidemiology of skin cancer in Australia

- Australia has highest rate of skin cancer in the world. Why?
- We are living in the wrong place for our skin!

Two main types of skin cancer:

1. Non-melanoma skin cancer (NMSC) :

- BCC (basal cell carcinoma) and
- SCC (squamous cell carcinoma)

90% of NMSC caused by UV exposure

2. Malignant melanoma

65% melanoma caused by UV exposure

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4307792/ Kim and He 2014

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International Agency for Research on Cancer (IARC) skin carcinogens- group 1

- Solar radiation

  -Basal cell carcinoma, squamous cell carcinoma, melanoma

  -Based on population studies

- X-radiation or gamma-radiation
  - Basal cell carcinoma
  - Based on studies of atomic bomb survivors and patients

IARC skin carcinogens- group 1

- Ultraviolet radiation (wavelengths 100-400 nm, encompassing UVA, UVB, and UVC)
- UV-emitting tanning devices (especially UVA)
  - Melanoma & ocular melanoma
- Welding
  - Ocular melanoma OR 7.3, 2.6-20.1

Guénel P, Laforest L, Cyr D, Févotte J. Occupational risk factors, ultraviolet radiation, and ocular melanoma: a case-control study in France. *Cancer Causes & Control* 2001; 12(5):451-459.

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Incidence and prevalence of NMSC in Australia

- In 2011, 2448/100,000 person years
- In 1985, 555/100,000 person years
- Higher rate for men than women
- Increased ratio of BCC to SCC
- However, no increase in those less than 60 and declining rates over 45 yrs

Perera et al Australas J Dermatol 2015; 56: 258-67

- NMSC not reported to registries but almost 1,000,000 Medicare treatments in 2014
- NMSC is Australia's most costly form of cancer in dollar terms- $700 million annually

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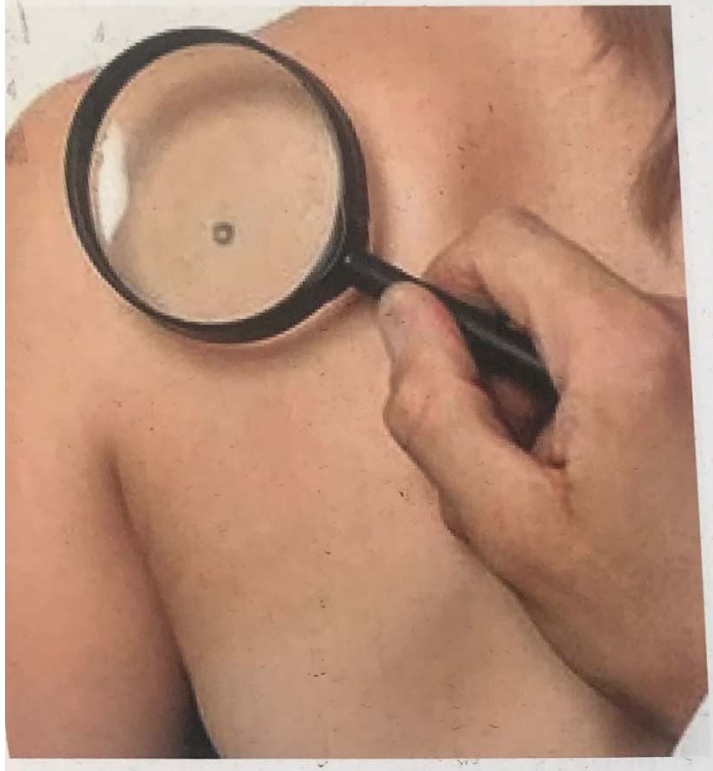

medicare
Bulk Billing

FREE

Skin Cancer Checks & Mole Removal

About Face Cosmetic & Skin Cancer Clinic

2 COLLINS ST, DOWNSTAIRS

VISIT US TO FIND OUT MORE

Epidemiology of skin cancer in Australia

- Melanoma > 12,000 cases 2012
  (4th behind prostate, bowel, breast)
  - Incidence of melanoma is 47/100,000 melanoma (90% survive 5 years)

- 2,162 people died from skin cancer in 2015 (1,520 malignant melanoma; 642 NMSC)

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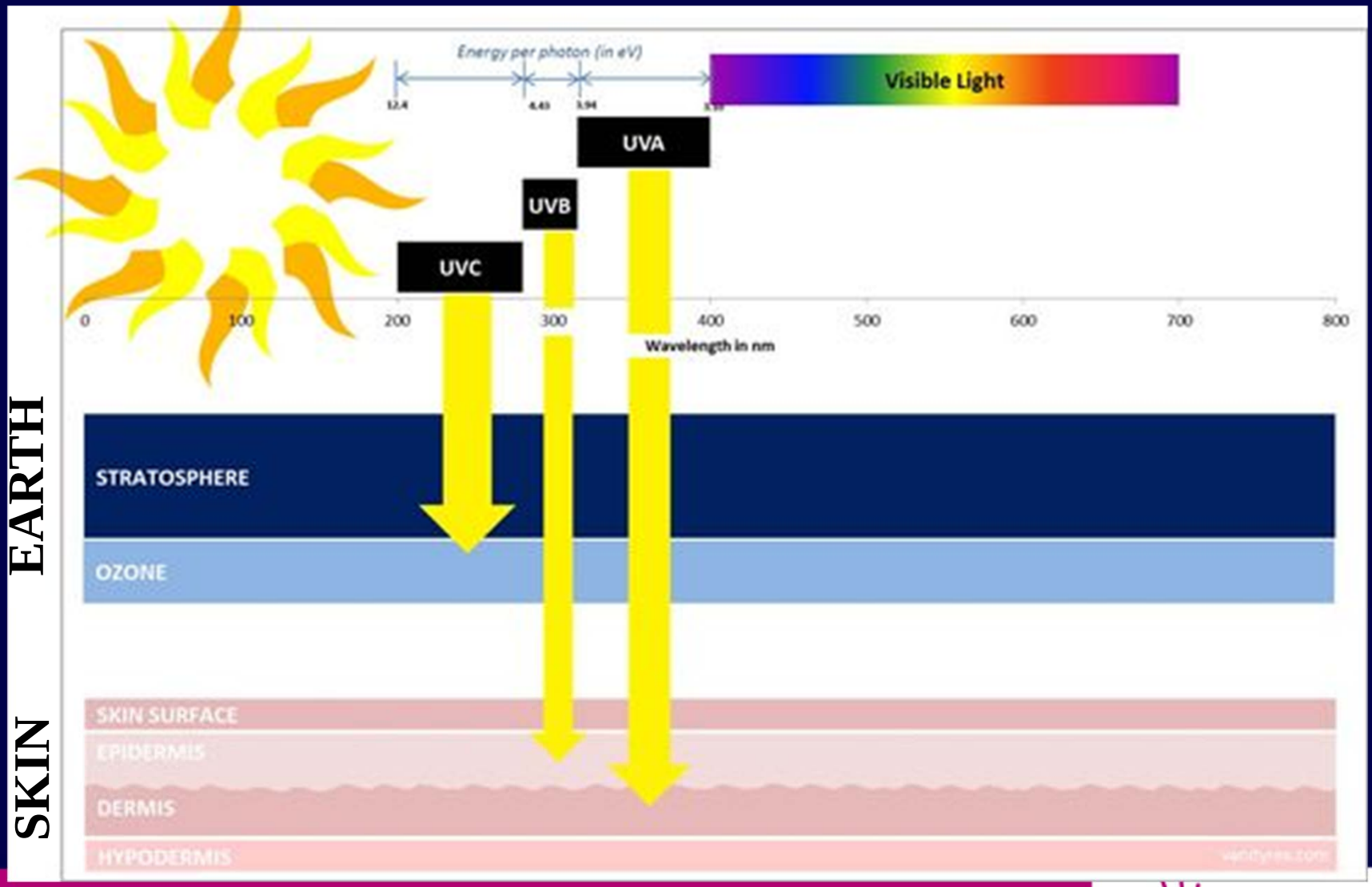
Ultraviolet RADIATION



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UVB

- Stimulates new melanin production
- Creates longer tan
- Sunburns
- Causes skin cancers
- Does not penetrate window glass

• UVA

- Activated melanin pigment in upper skin cells
- Penetrates deeper into skin layers
- Premature ageing
- Enhances development of skin cancer
- Penetrates glass

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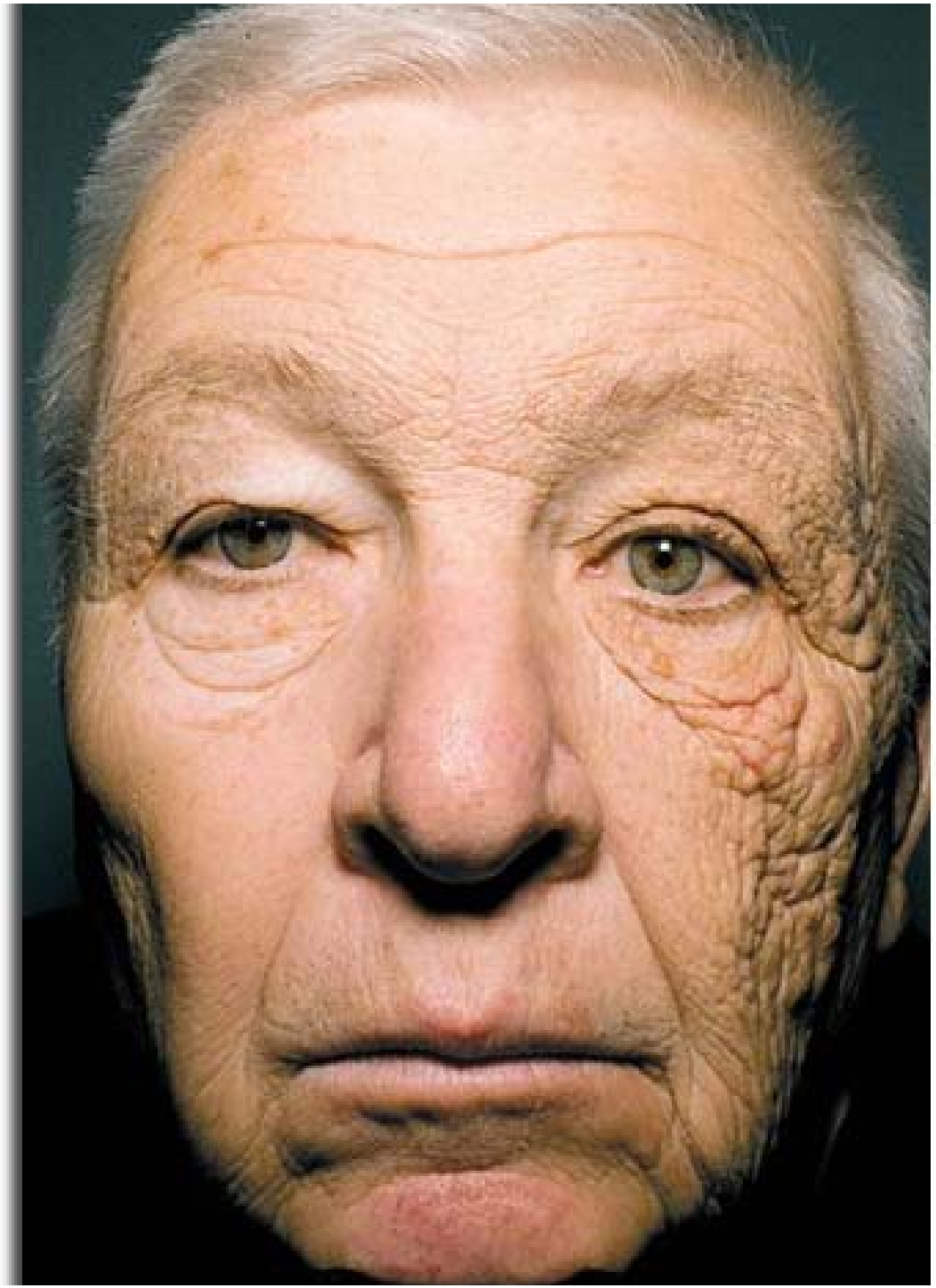

Skin ageing: 90% caused by sun

Exposed skin-outer arm

- Coarse wrinkling
- Telangiectasia-blood vessels
- Lentigines- liver spots
- Mottled pigmentation
- Elastotic, lax skin
- Skin fragility
- Dryness
- Yellow, sallow
- Skin tumours

Unexposed skin-inner upper arm, buttocks

- Smooth texture
- Clear, almost transparent
- Fine wrinkling
- Inelastic redundant skin
- Fewer skin tumours

A tan is a sign of sun damage

- We need to understand when and how we are getting cumulative sun exposure

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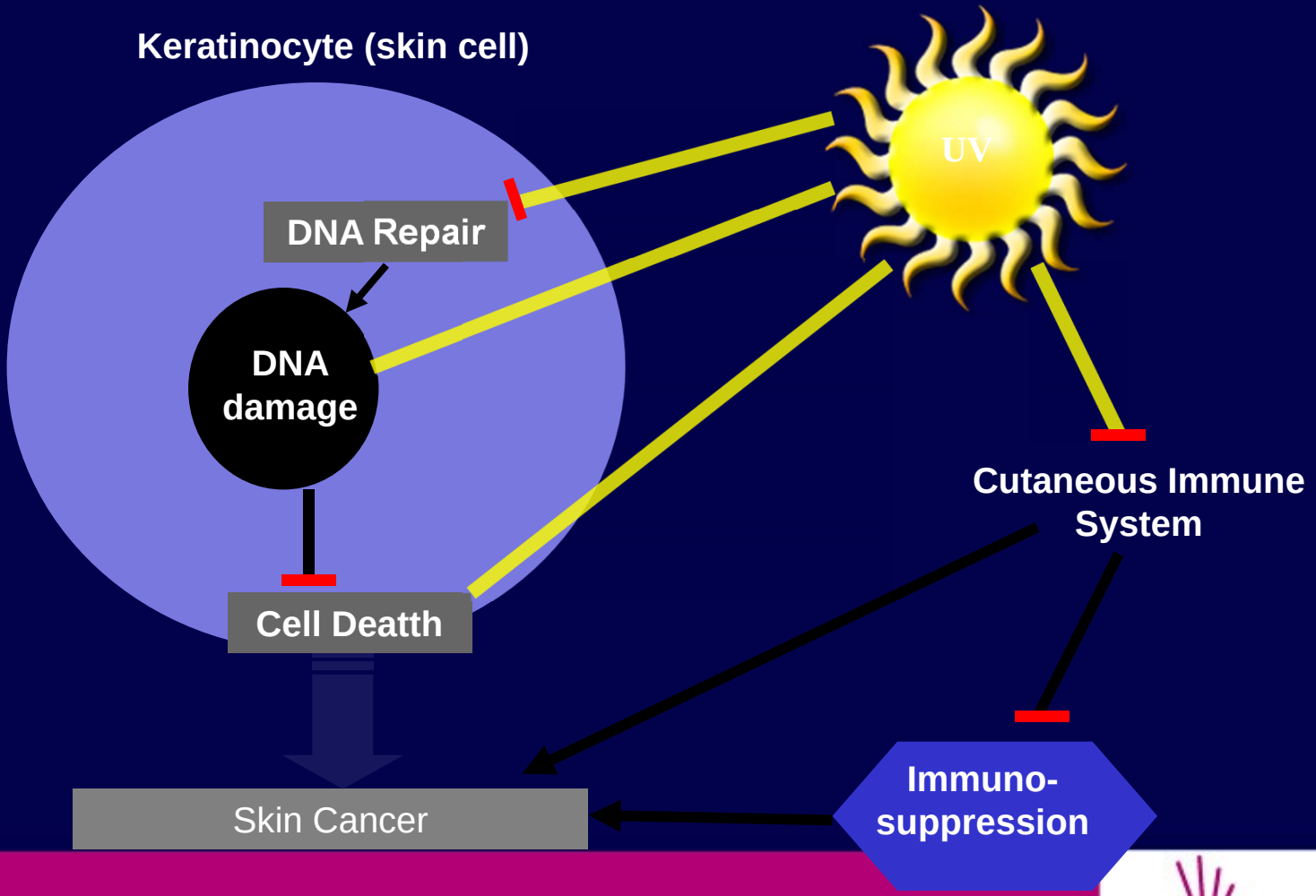
How does UV light cause skin damage?



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It starts with sunspots!
Solar keratoses (actinic keratoses)

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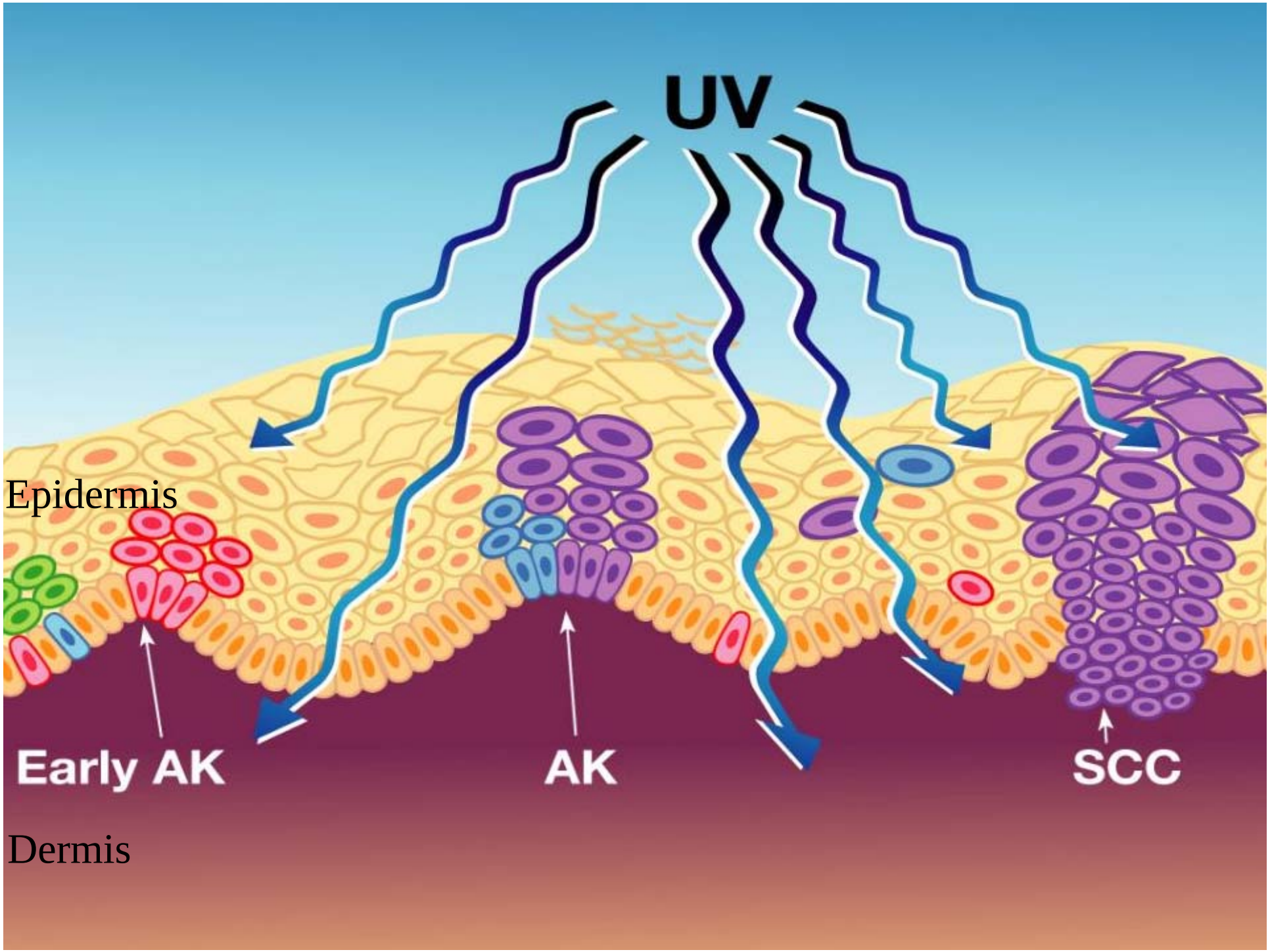
Solar keratoses (SKs, AKs)

- Solar keratoses are not actual skin cancers but feature atypical keratinocytes
- Marker of cumulative sun exposure
- Estimated to develop in 7-19% of persons 40 years or older in Australia annually
- Over 10 years, a person with 8 SK has a 6.1-10.2% chance of developing a SCC (squamous cell carcinoma)


UV
Epidermis
Early AK
AK
SCC
Dermis

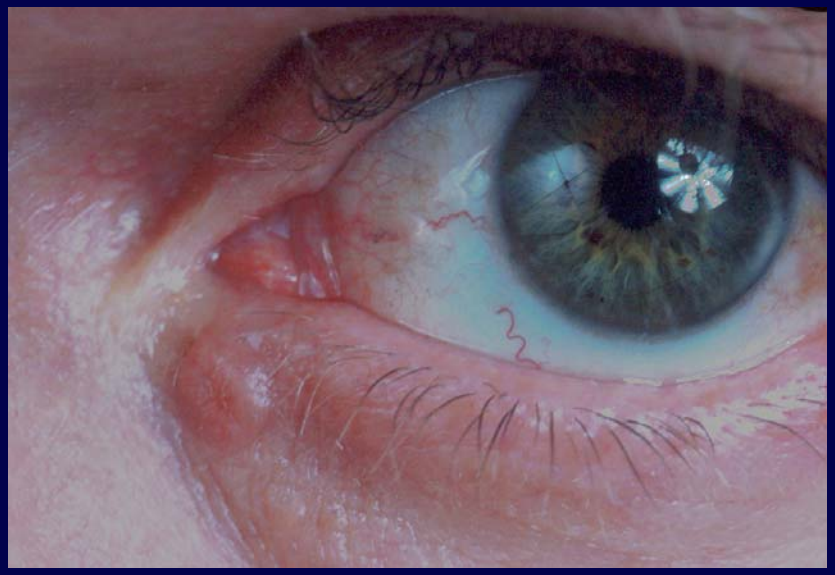
Solar keratoses occur on typically sun-exposed sites….

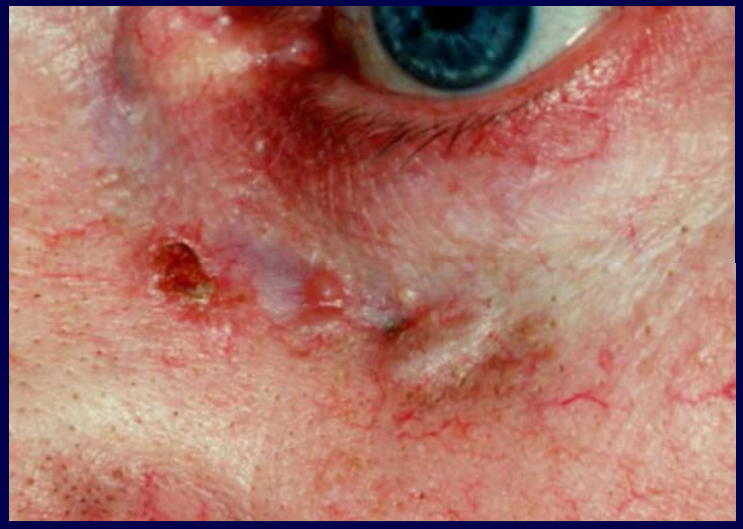
Need surveillance of rest of the skin

Squamous cell carcinoma

- Fair skin
- Sun-exposed sites
- Sun exposure
  - Cumulative
  - Esp outdoor workers
- Age >60
- Prior solar keratoses
- Immunosuppression
- 2% metastasise
- 10-15% from lip,ear

Basal cell carcinoma: different clinical types; genetics/family history important





- Superficial
- Nodular
- Morphoeic/fibrosing


flat red patch
may be slightly raised (plaque)
scaly
can ulcerate
may mimic AK, tinea (ringworm), eczema, psoriasis

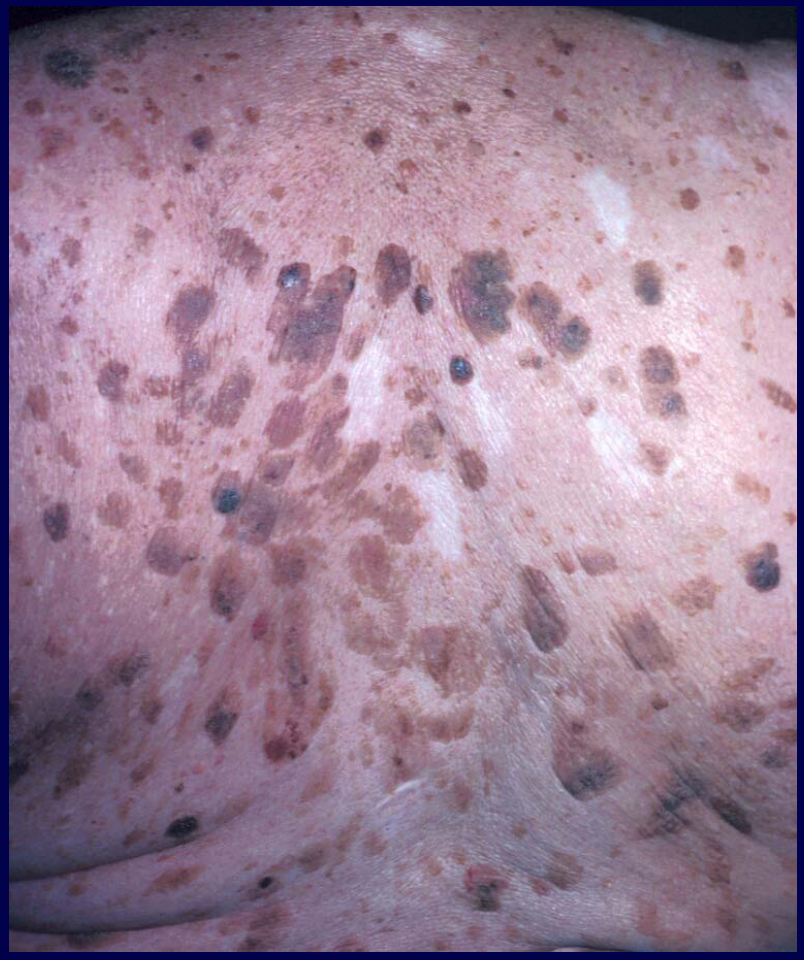

pearly (shiny)
rolled edges
telangiectatic (visible blood vessels on surface)
can ulcerated
usually well-defined/distinct

- scar-like
- indistinct borders
- difficult to visualise
- needs careful treatment to prevent incomplete excision or recurrence

Take home messages NMSC

- Importance of cumulative sun exposure and latitude of residence, especially when growing up
- Family history important, especially for BCC
- BCCs may bleed and be tender when touched; may present with small non-healing sores; grow slowly
- SCCs may be raised and painful when knocked, especially on backs of hands
- Need to avoid sunburning

Seborrhoeic keratoses- not skin cancers- caused by ageing, sun and genetics, completely benign



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Diet helps too!

- High intake of vegetables, legumes and olive oil appeared to be protective against cutaneous actinic damage
- High intake of meat, dairy and butter appeared to have adverse effects

- Purba MB; Kouris-Blazos A; Wattanapenpaiboon N; Lukito W; Rothenberg EM; Steen BC; Wahlqvist ML J Am Coll Nutr 2001 Feb;20(1):71-80

Nicotinamide 500mg (Vitamin B3) twice daily in NMSC prevention

- Phase 3 randomised trial Sydney Prof Diona Damian
- 386 patients with past NMSC
- Reduced rates of NMSC by 23% at 12 months
- Chen et al N Engl J Med 2015; 373:1618-1626

It’s important to understand how UV works…to limit cumulative UV exposure and avoid sunburning

- “What date of the year is the sun strongest in Melbourne (Sydney), that is, the most burning?”

- Wong C, Liu W, Gies P, Nixon R. Think UV not heat. Australas J Dermatol. 2015;56:275-8.

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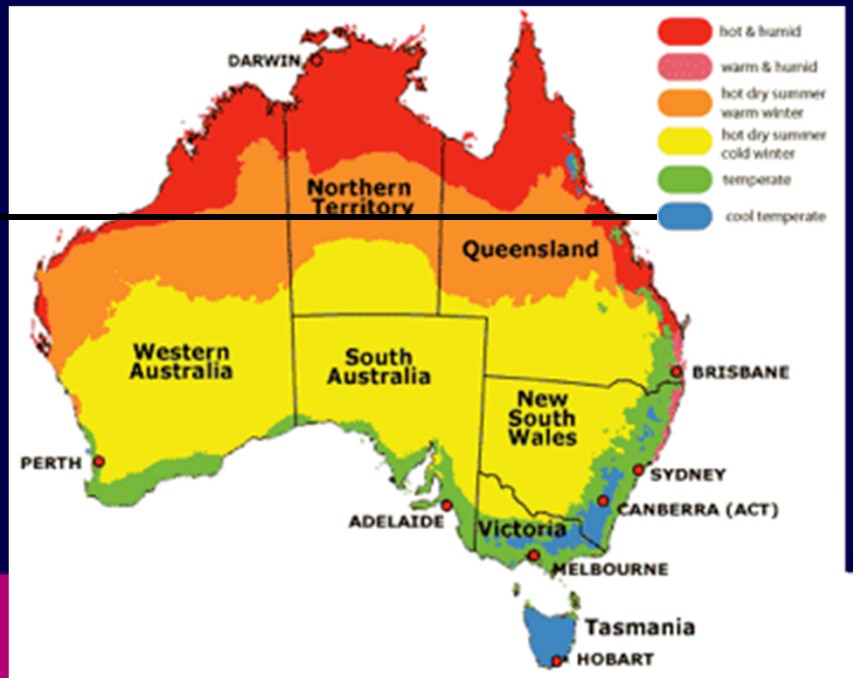
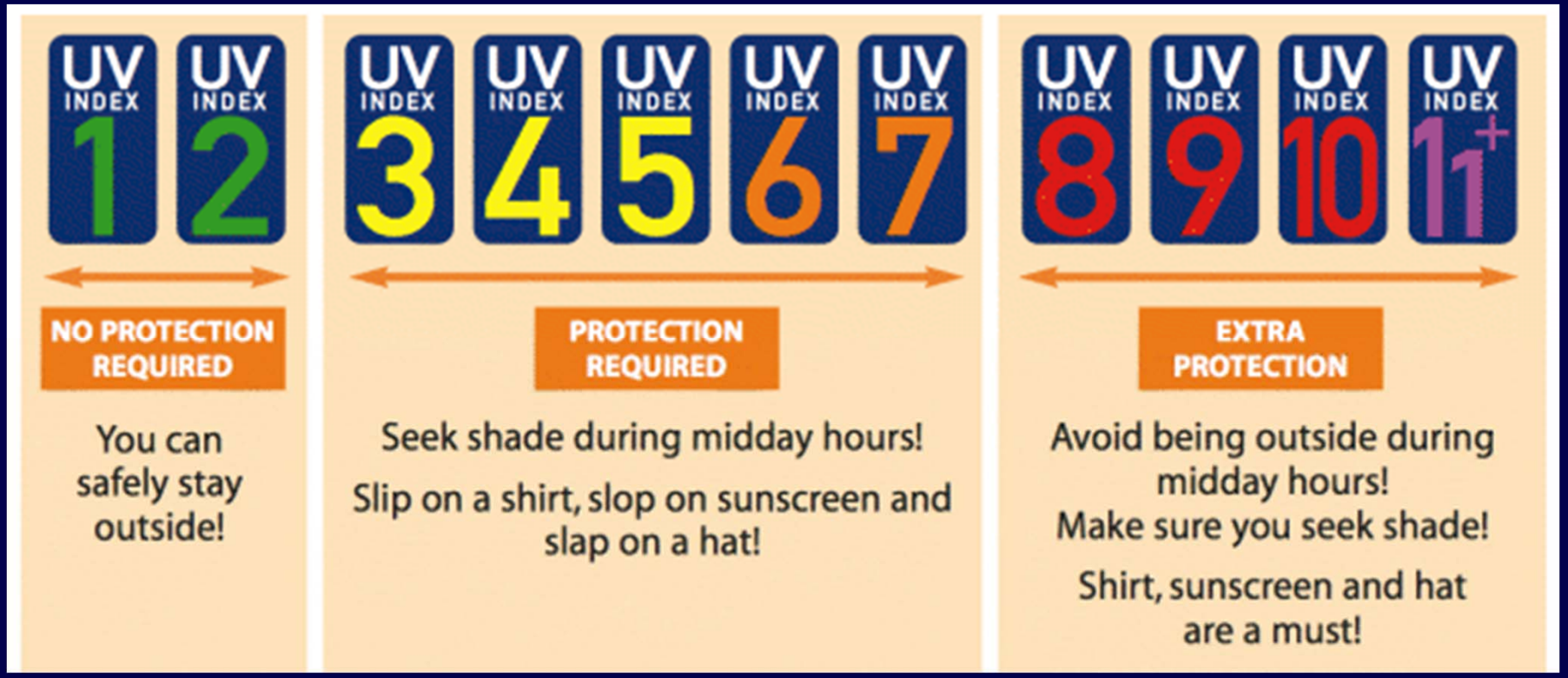
Answers

- For those residing south of the Tropic of Capricorn: theoretically **21st December**
- (Even higher UVR levels are associated with the Earth being closest to the sun on or around **3rd January)**
- Will vary north of the Tropic



UV index- 3 is crucial level for sun protection



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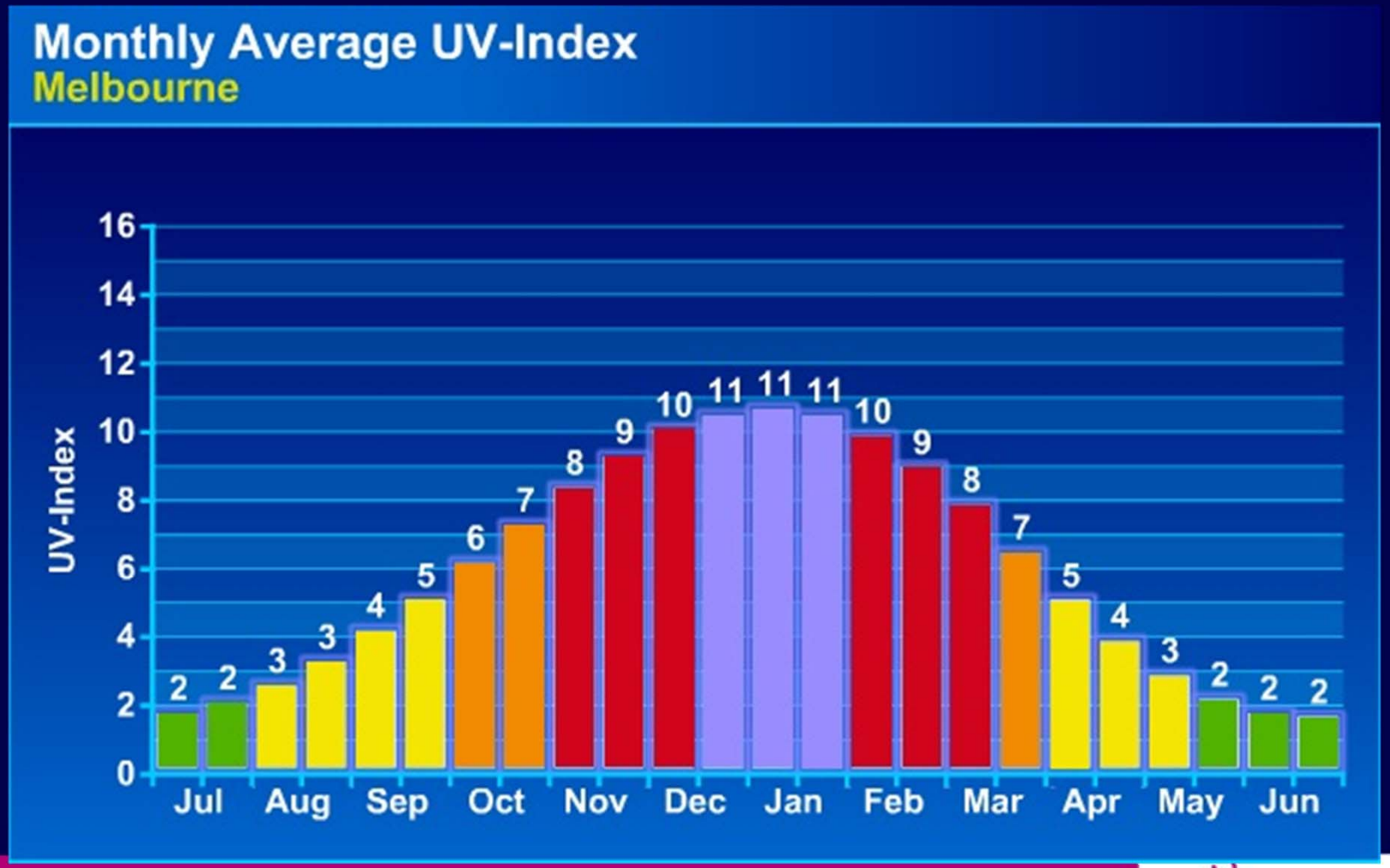
UV index and Melbourne



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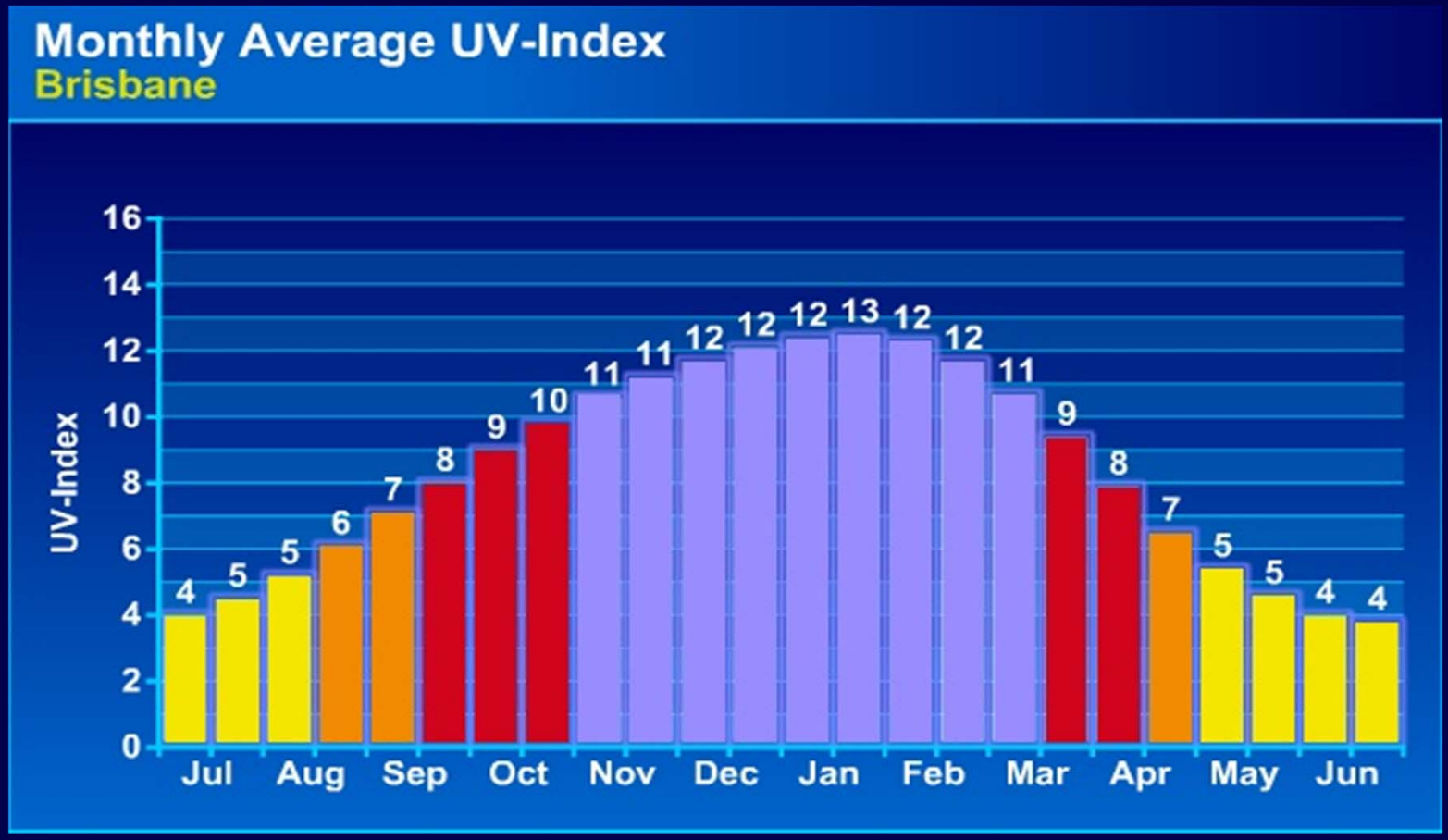
UV index and Brisbane



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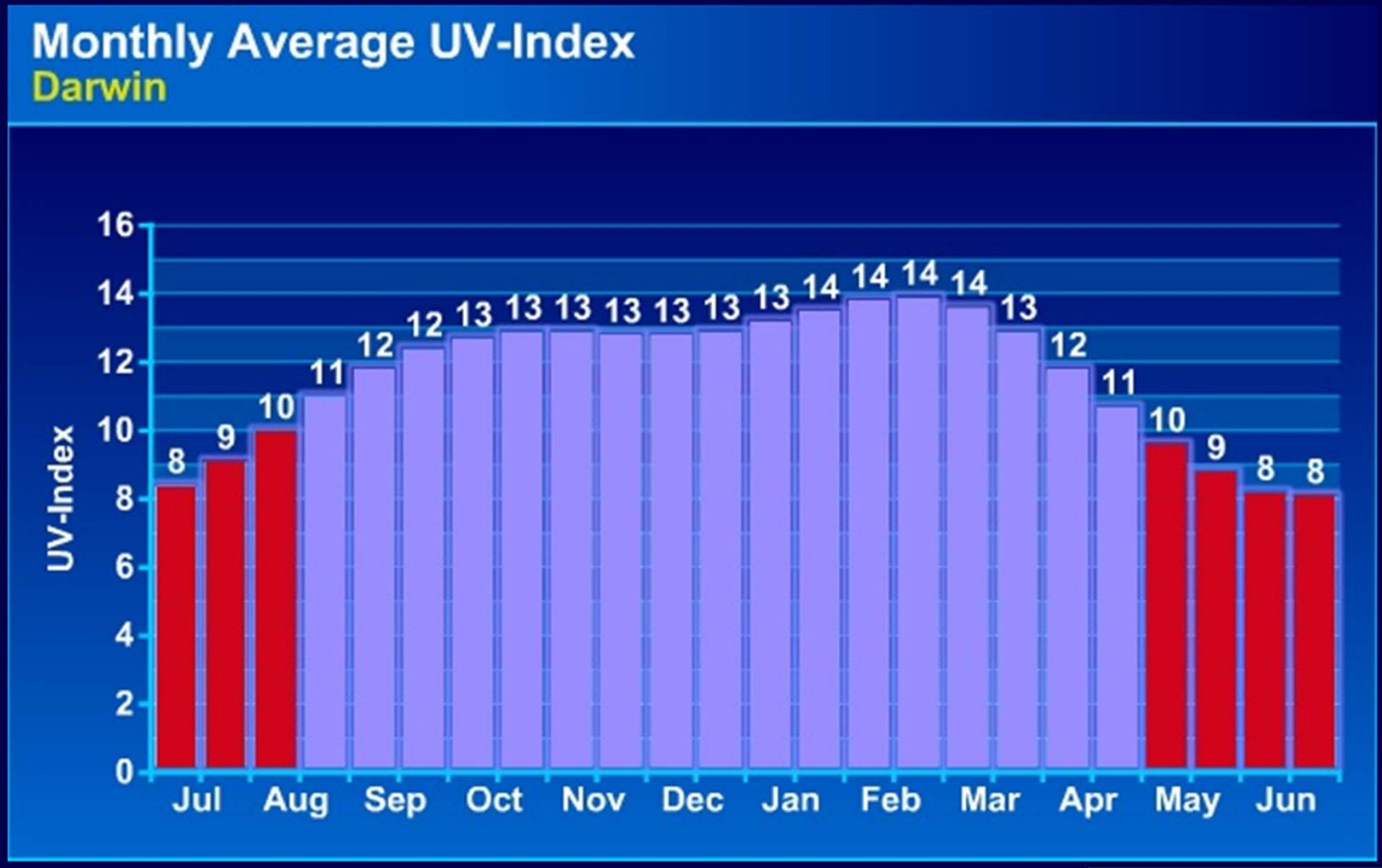
UV index and Darwin



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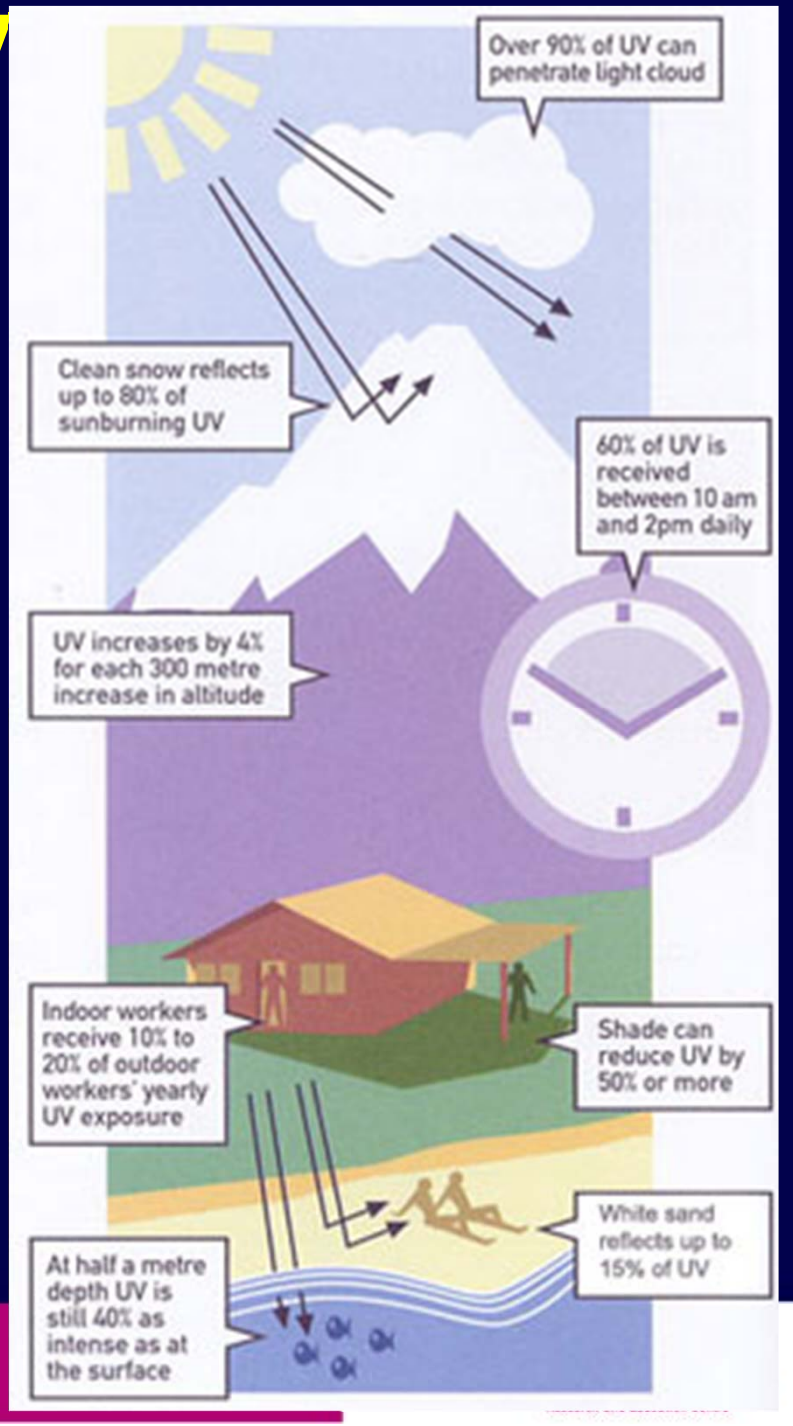
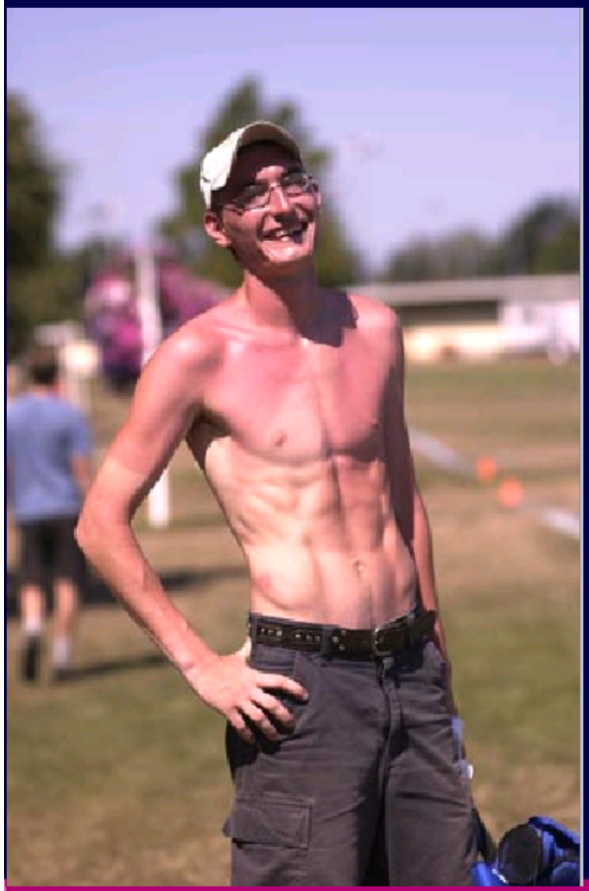
Factors influencing UV radiation

- Sun height
- Latitude
- Altitude
- Cloud cover
- Ozone
- Ground reflection
  - Snow reflects 80% UVR
  - Sea foam
  - Dry beach -15%



It’s the date that burns you, not the temperature!



- Cool spring temperatures in southern Australia can lead to sunburning- especially around the time of the Melbourne Cup, when the UV index will be around 9 in Melbourne
- Especially so in Tasmania
- In southern Australia, a 20 degree day in Dec will have higher UV than a 40 degree day in March

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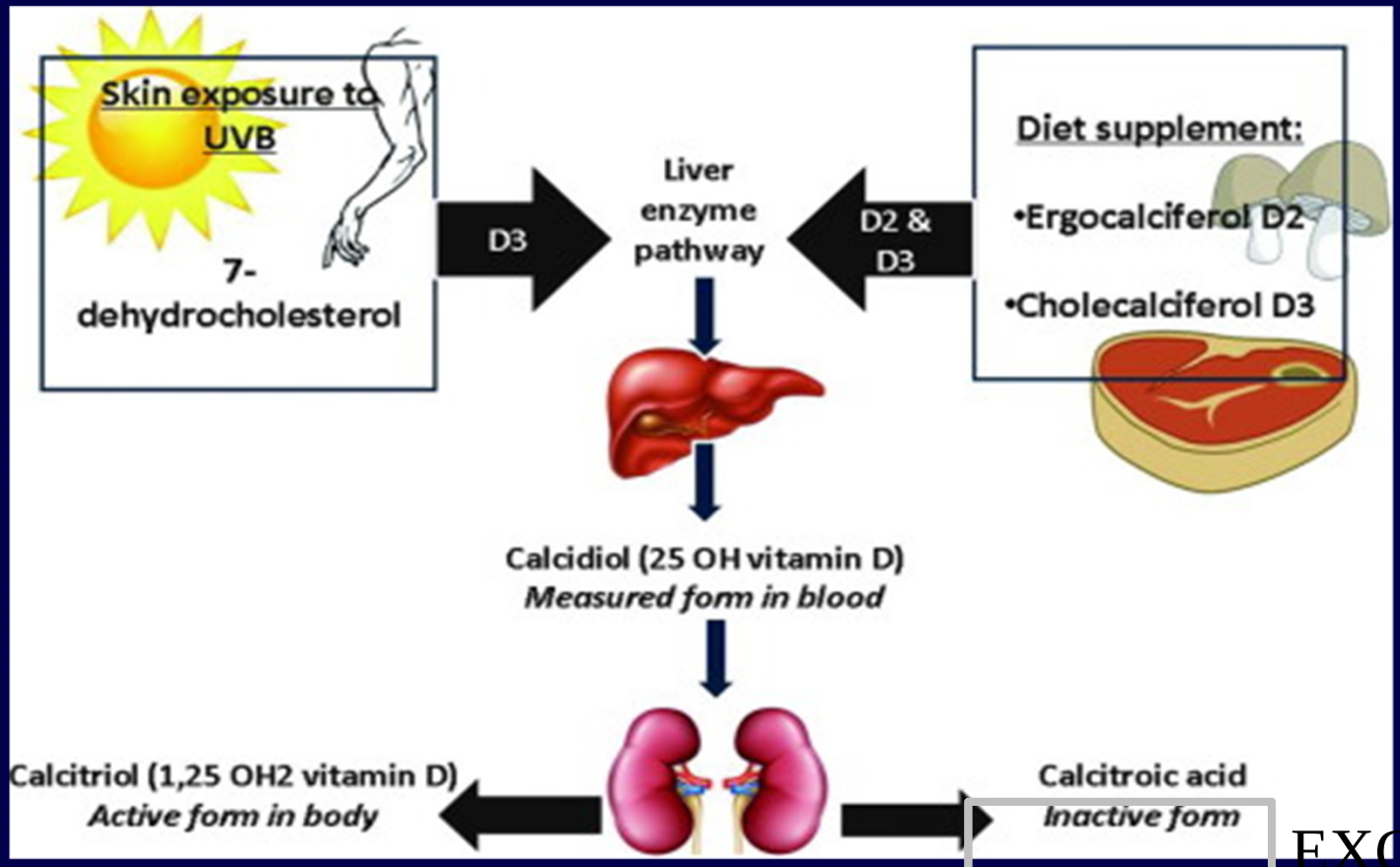
The sun protection message and the Vitamin D message get confused



EXCESS VIT D

Figure taken from:
"Vitamin D and the skin: Focus on a complex relationship: A review"
Journal of Advanced Research Volume 6, Issue 6, November 2015, Pages 793–804

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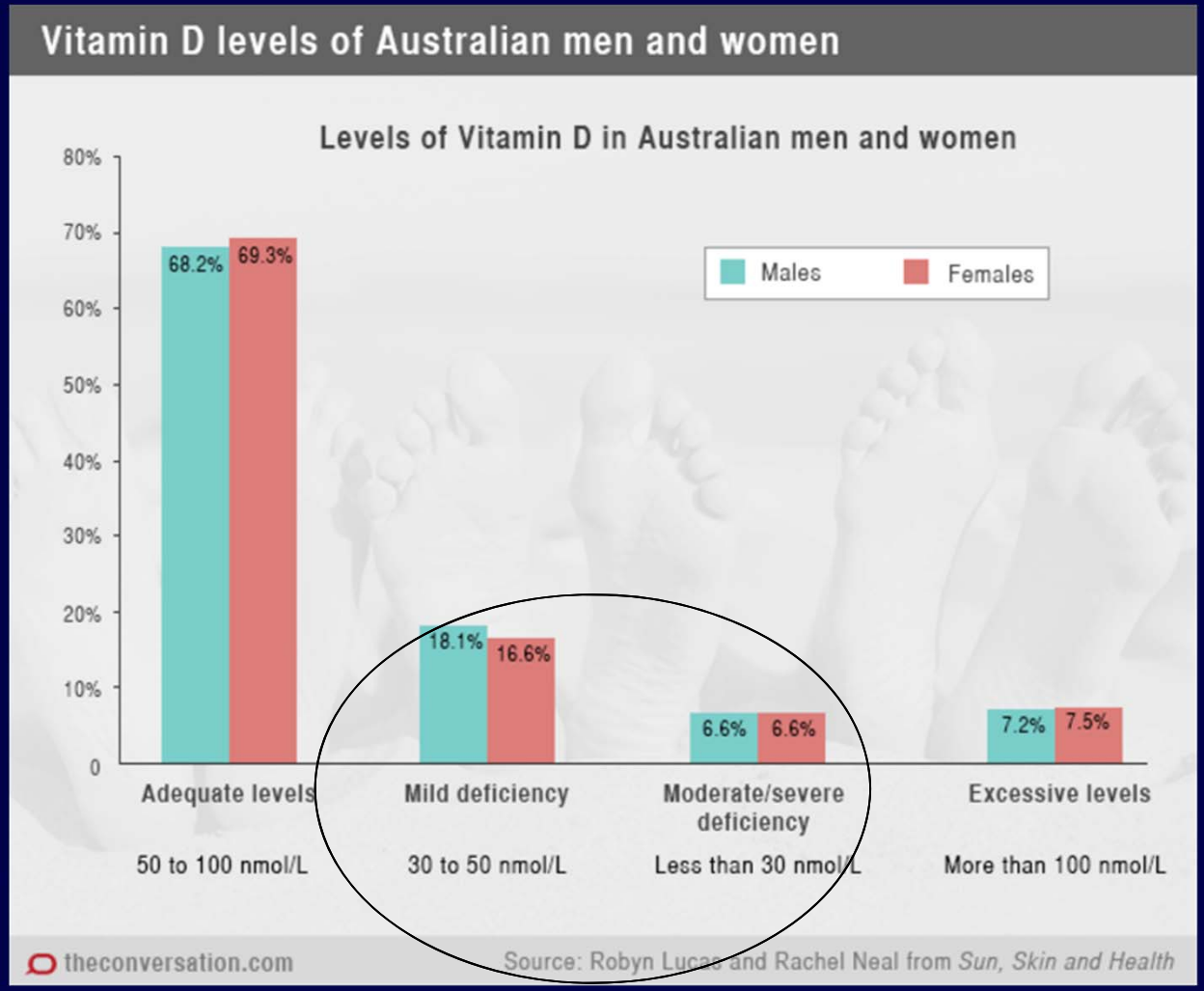
Vitamin D levels in Australia



http://theconversation.com/how-to-protect-your-getting-enough-vitamin-d-34143

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Vitamin D status by state during winter

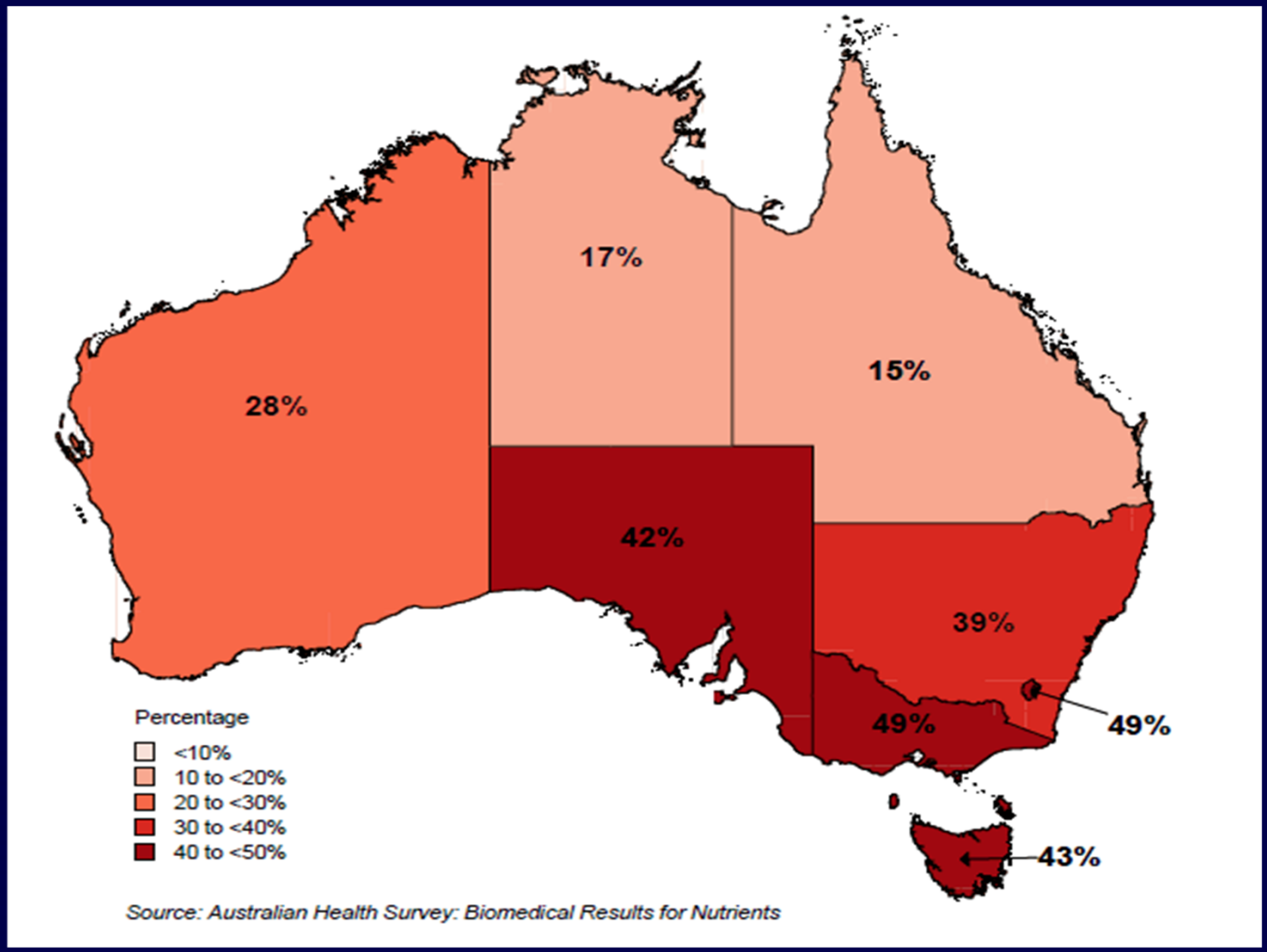

Figure taken from: Australian Health Survey: Bi
Results for Nutrients, 2011-12 , published on 15

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How to achieve a balance between appropriate sun protection and Vitamin D

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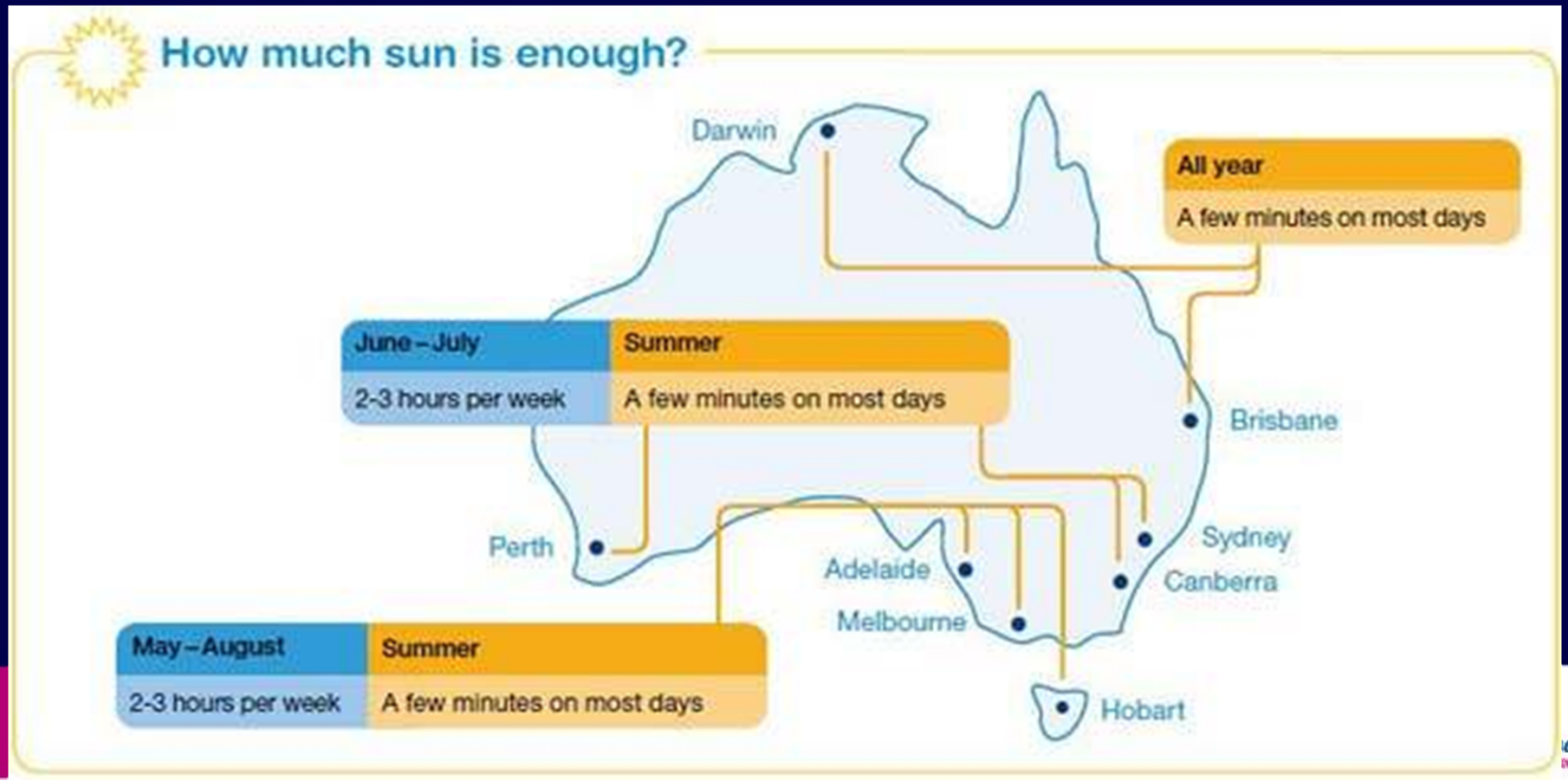
Balance sun protection and getting Vitamin D

1. Protect yourself from the sun when the UV index is 3 (moderate) or above
2. Deliberate exposure to the sun when UV index is 3 or above increases the risk of developing skin cancer

Balance sun protection and getting Vitamin D

3. Get sun exposure outside the times when the UV index is 3 or greater.

Those with darker skin types will require 3-6 times this amount



Balance sun protection and getting Vitamin D

Summary recommendations for vitamin D

Skin Type	Season	Skin Exposed	Recommended time of day	Sun Exposure
Moderately Fair	Winter	Arms or equivalent	midday	7 – 30 minutes*
Darker skin	Winter	Arms or equivalent	midday	20 min – 3hrs*

*depends on location within Australia and type of skin

Skin Type	Season	Skin Exposed	Recommended time of day	Sun Exposure
Moderately Fair	Summer	Arms or equivalent	mid morning or mid afternoon	5 – 10 minutes
Darker skin	Summer	Arms or equivalent	mid morning or mid afternoon	15 – 60 minutes*

*depends on location within Australia and type of skin

Vitamin D. Osteoporosis Australia Medical & Scientific Advisory Committee 2016. http://www.osteoporosis.org.au/vitamin-d

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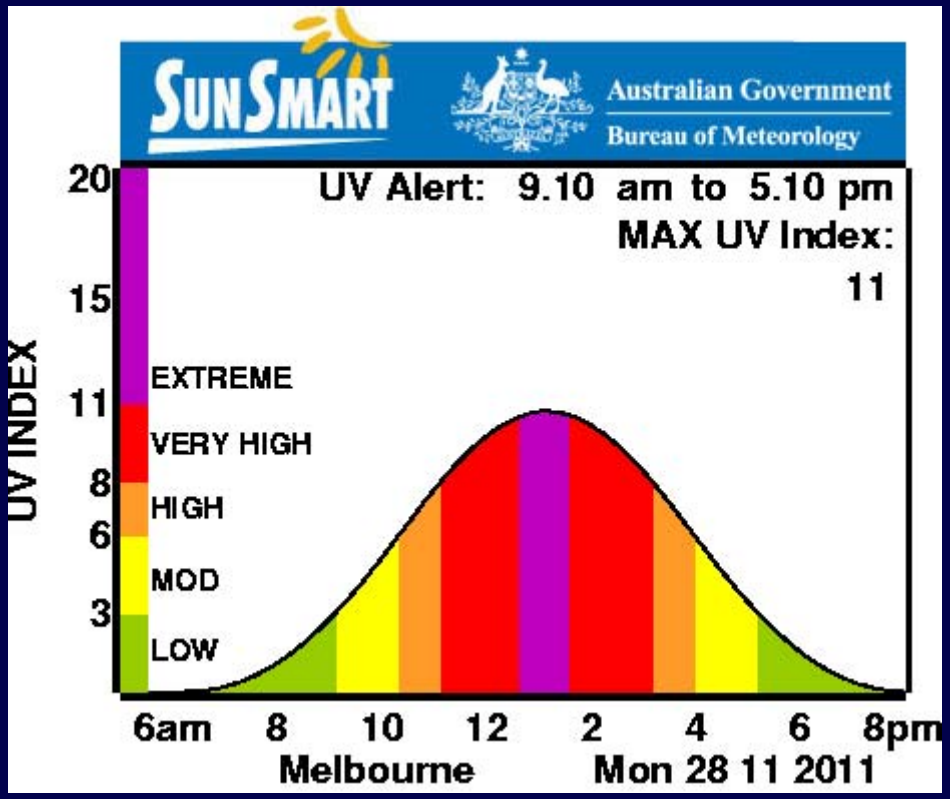
Use free Sunsmart app to monitor UV levels and plan exposure/protection



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Skin cancer protection

1. Use the Sunsmart app to check UV levels
2. Check your own skin and your partner's skin on the first weekend of every new season

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Thank you for listening!

Rosemary Nixon
rnixon@occderm.asn.au

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