Small Animal Dermatology
Structure of the skin

Largest single organ in the body

- Provides an enclosing barrier against the loss of water, electrolytes and macromolecules
- Acts as a mechanical protection against the environment
- Nerve sensors allow the perception of heat and cold, pressure, pain and itch
- Responsible for temperature regulation and storage of vitamins, electrolytes, water, fat, carbohydrates and protein
- Involved in the production of Vitamin D
Epidermis

Most superficial layer of the skin and is composed of keratinocytes (85), Langerhans cells (5-8%) and melanocytes (5%)

Layers of the epidermis:
1. Stratum corneum
2. Stratum lucidum
3. Stratum granulosum
4. Stratum spinosum
5. Stratum basale

The basement membrane separates the epidermis from the dermis
Dermis

- Consists of fibres (collagenous, reticular and elastin), ground substance, cells and epidermal appendages
- The epidermal appendages include hair follicles, arrector pili muscles, sebaceous glands, sweat glands, blood vessels, lymphatics and nerves
Approach to the dermatological case

- Signalment
- Presenting complaint
- History
  - Focused and generalised – of animal
  - environment/travel/boarding
  - Previous therapy very important
- Physical examination
Dermatological examination

- Examine entire body
- Mucous membranes
- Observe the animal (while in the waiting room and in the examination room)
- General assessment of the coat
  - Distribution of the lesions
  - Dry or greasy coat
  - Colour texture
- Skin assessment
  - Thorough examination of skin
  - Check skin quality (atrophic/inelastic – hyperadrenocorticism, hyperelastic – Ehlers-Danlos syndrome)
  - Skin colour
  - Primary or secondary dermatological lesions
  - Evaluate any areas of alopecia (hair fell out or nibbled short)
Dermatological examination

- **Skin assessment**
  - Thorough examination of skin
  - Check skin quality (atrophic/inelastic – hyperadrenocorticism, hyperelastic – Ehlers-Danlos syndrome)
  - Check skin temperature by touch
  - Skin colour
  - Primary or secondary dermatological lesions
  - Evaluate any areas of alopecia (hair fell out or nibbled short)
Dermatological examination

- Hair assessment
  - Does hair epilate easily (hormonal aetiology?)
  - Unusual look to the hair (follicular casts)

Then develop a list of differentials and any further diagnostic tests to be performed
Diagnostic tests

Initial diagnostic tests

- Wet paper test – red streaks
- Coat brushings – Cheyletiella, lice
- Acetate tape impression smears of the coat – eggs, lice
- Acetate tape impression smears of the skin – can stain with e.g. Diff-Quik, to look for bacteria, yeast e.g. Malassezia etc
- Skin scraping
  - Deep – can mount in either 10% potassium hydroxide or liquid paraffin. scabies (ear tips)
  - Superficial – Cheyletiella
- Hair plucking/trichography – to help analyse hair (trauma)?, pigment changes (e.g. in colour mutant alopecia), follicular casts (e.g. sebaceous adenitis), follicular dystrophy, organisms (Demodex esp from feet), fungal. Can also analyse the bulbs looking for hairs in telogen phase (endocrinopathies). Can pluck hairs for dermatophyte culture.
Demodex canis
Cheyletiella
Ringworm – *Tricophyton mentagrophytes*
Diagnostic tests

- Impression smears – of lesions, esp ulcerated neoplastic masses
- Microscopic examination of pustular contents (bacterial infection – degenerate neutrophils and bacteria. With immunological diseases may see acanthocytes and non-degenerate leukocytes)
- Fine needle aspirates (FNA)
- Examination of ear wax
Otodectes cynotis
Further diagnostic tests

- Bacterial culture and sensitivity
- Fungal/yeast culture
- Tissue culture – biopsy sample for deeper lesions – can do bacterial and fungal
- Biopsy – in cases of:
  - Suspected neoplasms
  - Ulcerative/vesicular/bullous lesions
  - Skin disease unresponsive to rational therapy
  - Unusual or serious skin disease, esp when the animal is systemically unwell
  - To make a diagnosis in a disease where expensive or potentially dangerous drugs are to be used
Further diagnostic tests

- Allergy testing
- Trial therapy
- General tests such as CBC, serum biochemistry, endocrine screen, dynamic endocrine function tests, radiography, etc
Biopsy punch
Intradermal skin testing