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Conference or Workshop Item

Title: Canine skull morphology: what we know so far

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Canine Skull Morphology; What We Know So Far

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2nd/DOS Dr. Robin Crockett

- Dogs have the greatest phenotypic diversity of all (sub)species
    - 1.5kg up to 90kg
- Dogs are very popular: UK population is estimated at 8.5million (PFMA, 2016)
- Currently a lot of scientific interest into the impact of skull shape on health of dogs (Koch *et al*., 2003; Knowler *et al*., 2014; McGreevy *et al*., 2013)
- Skull shape categories need refining (Georgevsky *et al*., 2014)

Current Research and Key Findings

- Georgevsky *et al*. (2014)
  - Observed correlation between cephalic index and intelligence
- – Cephalic index is not sufficiently dynamic
- Discrepancy between cephalic index and breed categorisation (Andrews et al., 2015)
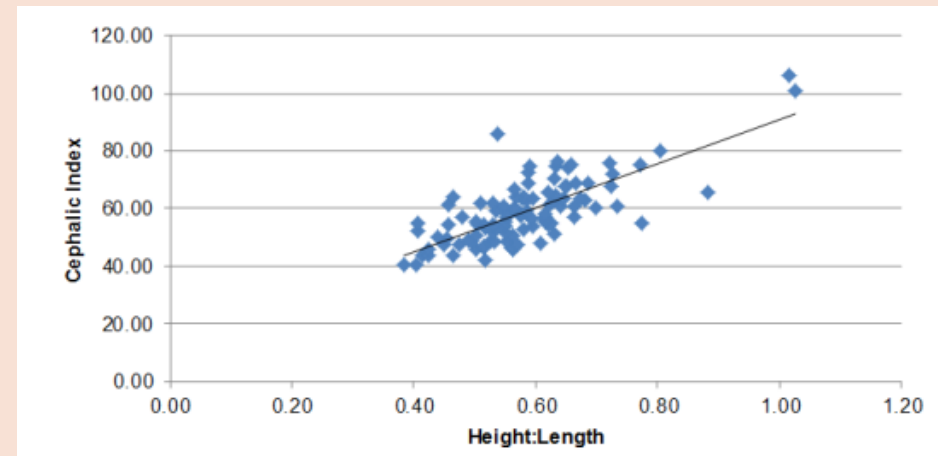 - Positive correlation when height included

Figure 1. Correlation between the cephalic index and the height : length ratio of canine skulls (n=107) (Andrews *et al*., 2015)

Current Skull Categories

Category	Brachycephalic	Mesocephalic	Dolicocephalic
Parameters	Length < width	Length = Width	Length > Width
Proportion	> 80%	75-80%	< 75%

- Based on human morphology of skulls
- BUT dogs have a rostrum in addition to their skull

Images from publicdomain.net

Measuring Categories

- Currently 14 different indices in use

- Most common is Cephalic Index

- Need for a more dynamic categorisation

Image: (Georgevsky *et al*., 2014)
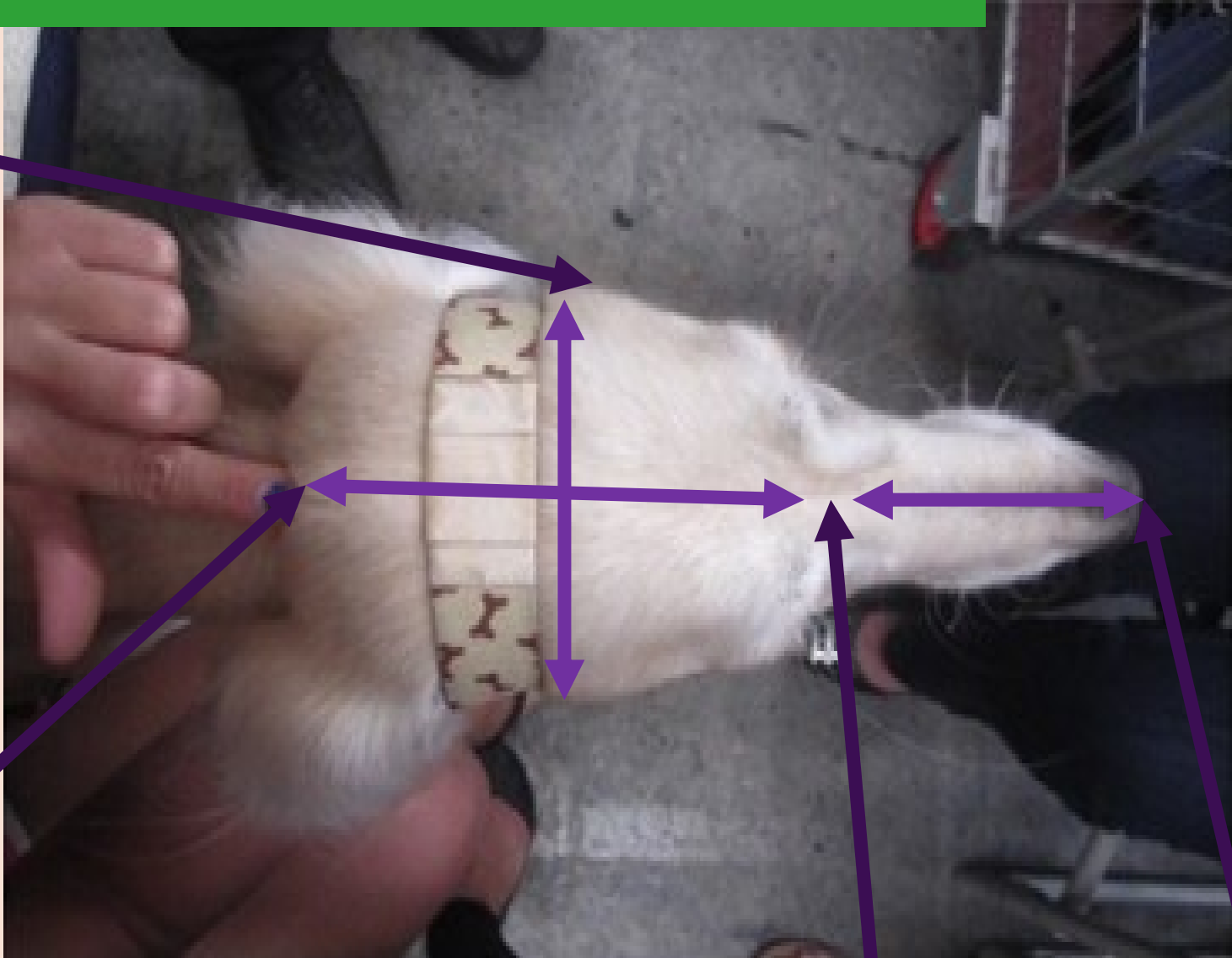
Measurement Points

Zygomatic Arch

Inion

Nasion (stop)

Prosthion

Image: Georgevsky *et al*., (2014)

Variation within categories

Images from publicdomain.net

My Aims and Objectives

The aim is to investigate relationships between skull shape and dental health and manducation methods

The Objectives are:

- To establish clear definitions of the skull categories for the domestic dog using a wider range of dimensions.

- To gather data on the incidence of dental problems across a range of skull shapes and sizes.

- To determine whether manducation patterns vary between dogs of different classifications when consuming the same food type.

- Sample of 600 pedigree dogs (minimum)

- 20 breeds selected to focus on (The Kennel Club, 2015)

- n=15 males and females for each breed

- Measurements taken of each set of points

Breed Selection
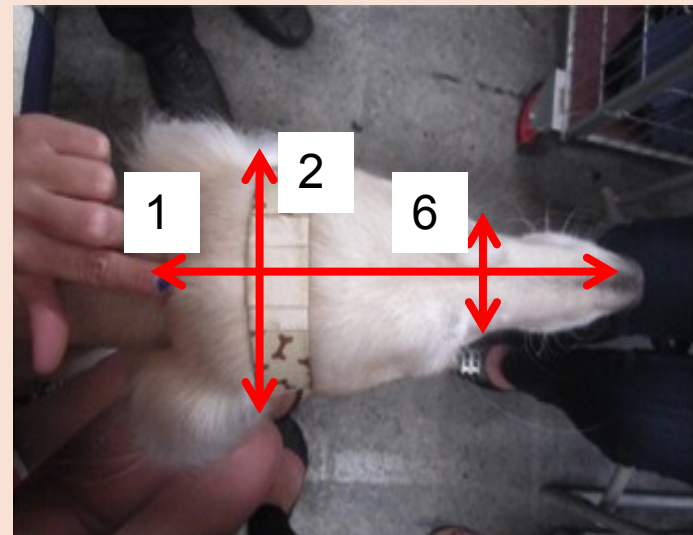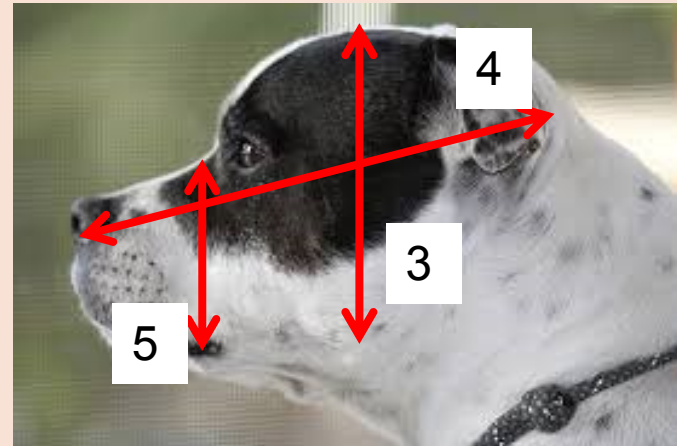
- Chihuahua (smooth)
- Miniature Schnauzer
- Pug
- Shih Tzu
- Staffordshire Bull Terrier
- West Highland White
- Whippet
- Border Collie
- Flat Coated Retriever
- Saluki

- Beagle
- Dachshund (mini smooth)
- GSD
- Golden Retriever
- Cocker Spaniel
- English Springer Spaniel
- Boxer
- Border Terrier
- Bulldog
- Shar pei

Aims for Later Phases

- Observe for clusters of data
  - Confirm categories
- Compare categories to prevalence of periodontal disease and eating methods
  - Retrospective dental record analysis
  - Creation of a chew analysis tool

Dog Recruitment

- Currently seeking contacts with dogs who would be willing to take part

- Either I measure their dog or they send images to analyse

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Questions?

References

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