# Journal club checklist

This checklist provides an outline that you can use to guide your discussion of any article in your journal club. Further advise and tools to use when critically appraising papers can be found in the [EBVM Resources page.](https://knowledge.rcvs.org.uk/evidence-based-veterinary-medicine/ebvm-resources/tools-guidelines-and-checklists/)

|  |  |
| --- | --- |
| **Title** | [**Training and validation of a novel non-invasive imaging system for ruling out malignancy in canine subcutaneous and cutaneous masses using machine learning in 664 masses**.](https://doi.org/10.3389/fvets.2023.1164438) |
| **What are the aims or objectives of the study?** | The aims and objectives are stated in two separate ways:  *To train and validate the use of a novel artificial intelligence based thermal imaging system as a screening tool to rule out malignancy in cutaneous and subcutaneous masses in dogs.*  *This prospective validation study aimed to assess the performance of the HT Vista machine learning algorithm in classifying lesions as either benign or as masses that require additional diagnostics.* |
| **When and where was the research carried out?** | The study was carried out in Israel between June 2020 and July 2022. |
| **Are there any potential sources of bias?** | It should be noted that HT Bioimaging funded this clinical trial, and that the majority of the authors are employed by HT Bioimaging.  The remaining author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.  **Do you think this may have influenced the reporting of the study?** |
| **Why do you want to review this paper?** | Think about the information you want from reading the paper, this may include whether you would want to use this system in your own practice and if so when it would be appropriate to do so. |
| **What methods did the researchers use?** | The researchers carried out this prospective diagnostic study in two parts: a training study and a validation study. |
| **Does this study aim to validate a new test (against a reference standard) or compare two validated tests?** | The study is comparing a new test against current testing methods.  How many cases were compared against cytology and how many against histopathology? Do you consider these to be appropriate reference standards? |
| **What is the rationale for using the HT system for ruling out malignancy?** |  |
| **Is the study design described clearly enough to enable you to follow what was done?** |  |
| **Are number and type of patients included in this study clearly described?** | The training study used 147 client owned dogs with 233 masses and the validation study used 299 client owned dogs 525 masses. |
| **Are the inclusion and exclusion criteria clearly described?** | What types of tumours were included or excluded? |
| **Are these patients relevant to your practice, if not what differences need to be considered?** | Looking at the paper were the types of dogs and types of tumours similar to those that you see in your practice? |
| **Where the animals divided into groups?** | The animals were not divided into groups for comparison but there were two separate groups, those in the training study and those in the validation study |
| **Were the assessments blinded?** | Did the people who interpreted the tests know the result of the other test for that patient? |
| **What are the important findings of the study?** | When considering results concerning diagnostic tests the important results are  **accuracy** (how many results agreed with the reference result)  **sensitivity** (the ability to correctly identify those with disease = True Positive Rate)  **specificity** (the ability to correctly identify those without the disease = True Negative Rate)  But it is also important to consider the **positive and negative predictive values**, which are influenced by the prevalence of the disease.  (The negative predictive value is the percent of benign masses identified as benign)  **What were the results for the training study and what were the results for the validation study?** |
| **Are all patients accounted for in the analysis?** | In the validation part of the study 94 (18%) of mases were excluded because the cytology results were inconclusive.  **What impact could this have on the results of the study?** |
| **How many cases were diagnosed as false positives in the validation study?** | One hundred twenty-five lesions were classified as false positives. Detailed results are given in table 3.  **What does this mean?** |
| **Was the accuracy of the HT Vista system similar for different types of tumour?** | e.g. Lipoma, Mast cell tumour and sarcoma |
| **What does the difference between the reported positive predictive value and the reported negative predictive value tell us about the appropriate use of this test?** | The authors state that positive predictive value, and negative predictive value of the device and algorithm in this study were 26%, and 97%, respectively.  **What implications does this have for its use in practice?** |
| **What are the limitations of the study?** | Limitations of the study include   * the low number of malignant tumours included in both the training and the validation study. * Scanning “healthy” tissue from adjacent to the tumour. * The use of a combination of cytology and histology results |
| **Do the findings support or alter your current knowledge?** |  |
| **Having read the paper are there any other sources of information you need to access before changing practice?** |  |
| **What would be the impact of using this test on your patients/population?** |  |

**Reference**

Dank, G. et al (2023) Training and validation of a novel non-invasive imaging system for ruling out malignancy in canine subcutaneous and cutaneous masses using machine learning in 664 masses. *Frontiers in Veterinary Science*, 10, p.1164438. <https://doi.org/10.3389/fvets.2023.1164438>