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Impact of a checklist when interpreting Musculoskeletal (MSK) images and using Artificial Intelligence (AI)

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Introduction

Artificial Intelligence (AI) is being used increasingly in image interpretation tasks. Human reliance on technology and bias can cause decision errors[1-4]. A checklist, used with the AI to mitigate against such biases may optimise the use of AI technologies and promote good decision hygiene[5,6]. A checklist to aid radiographic image interpretation for radiographers using AI for image interpretation was formed and this study aimed to test its effect[7].

Aim: To test the effect of a checklist for Musculoskeletal (MSK) radiographic image assessment when using AI interpretive assistance.

Materials and Methods

Radiographers were asked to interpret five Musculoskeletal (MSK) examinations. They were then provided with the checklist and asked to reinterpret the same five examinations with the AI feedback[8] (Figure 1). During the interpretation sessions participants were asked to provide a diagnosis and a confidence level (between 1 and 10 with 1 = least confident and 10 = most confident) on the diagnosis provided.



Figure 1: Study protocol

Results

- Clinical practice experience varied, with a range of 2 to 40 years clinical experience cited.
- Participants found the bony detail and joints section of the checklist most beneficial (figure 2).
- Participants found the artefacts and normal variants section of the checklist least useful (figure 3).
- Nine participants found the checklist alongside the AI most useful and five participants found the AI element to be most useful on its own.
- Five participants found AI feedback to be helpful as it helped to critique the radiographic image interpretation more closely and rethink their own initial diagnosis.
- The majority of participants (n=11) did not change their minds regarding their diagnosis post checklist.
- Five radiographers' confidence in diagnosis increased from pre-checklist to post checklist by 12-14%. Six radiographers had a decrease in their confidence from pre-checklist to post checklist by 2-14%.

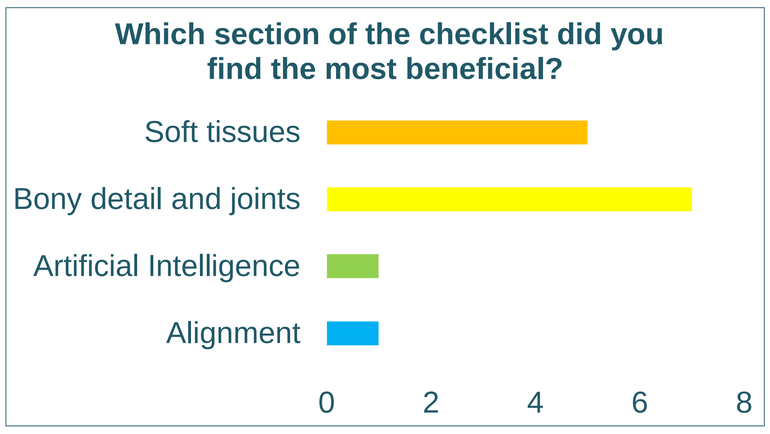


Figure 2: Sections of the checklist found to be the most beneficial

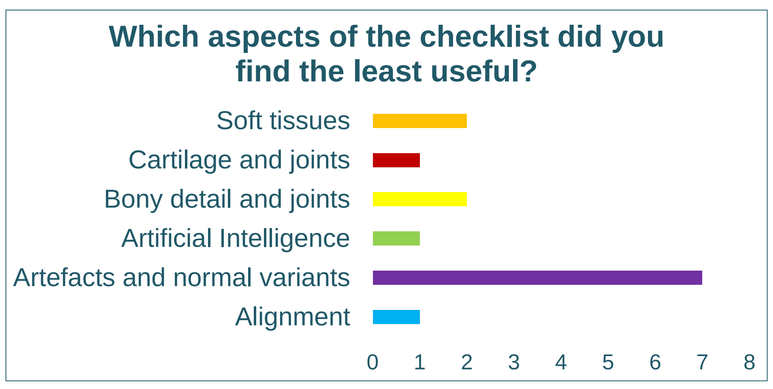


Figure 3: Sections of the checklist found to be the least useful

Conclusion

A novel checklist has been developed for use in image interpretation and to aid the interpretation of images when using AI. The checklist contained useful elements to the user but further developments can be made to enhance its use in clinical practice.

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