

## **Module 3: Machine minds: How can AI be applied successfully?**

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### **Introduction**

#### **Dr Marcello Moccia:**

Welcome to Module 3: Machine Minds – How Can AI Be Applied Successfully?

As digital technologies evolve, artificial intelligence is increasingly being explored as a tool to support clinical decision-making in multiple sclerosis. These innovations offer new opportunities, but they also raise important questions around reliability and clinical integration.

In this module, we are joined by Dr Riley Bove, who will examine how AI can be applied meaningfully in clinical practice and where human oversight remains essential.

### **Module 3**

#### **Current Applications of AI in MS Care**

##### **Dr Riley Bove:**

Let's review for a moment how AI and machine learning are currently being applied in multiple sclerosis.

One use case that has really taken off across different clinical settings is the AI-enabled scribe — a system that can listen to the patient's voice, transcribe the consultation effectively, summarise the neurological evaluation and convert the rich patient experience into concrete, actionable next steps for both the clinician and the patient.

When this is done well, it is truly time-saving and also provides patients with a valuable summary of their encounters.

This is one example where we have seen AI integrate effectively into healthcare and provide meaningful value through improved efficiency and workflow support.

We have also seen a number of other novel approaches that hold significant promise in improving disease detection and prediction.

These include new platforms that provide automated image processing, allowing us to more clearly visualise paramagnetic rim lesions, slowly enlarging lesions, brain volume loss and other markers of progression.

There are also new algorithms that enable us to detect PIRA-related changes from patient-generated data, including wearables and digital monitoring tools.

AI and large language models may also be used to analyse patient speech patterns automatically, helping detect trends in symptoms and patient experiences.

In addition, AI and machine learning are increasingly being used to analyse electronic health records more effectively and generate usable real-world data from what is currently a very large and complex information source.

All of these approaches hold considerable potential. However, there are still challenges in implementing them effectively at the point of care.

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### **Challenges of Clinical Implementation**

Where AI and machine learning still fall short is in developing real-time, scalable and interpretable clinical applications.

Human oversight remains essential to validate model robustness in the clinic, assess the impact of these tools on patient care and ensure these insights reach clinicians and patients in real time when needed.

Many current models are still being developed, deployed and validated, and challenges remain in integrating them meaningfully into clinical workflows.

A large amount of human oversight is still required because models must be validated in diverse real-world patient populations.

We also need to better understand the true impact of these AI-generated insights on real-world patient care.

Finally, we must ensure these insights are delivered according to the “five rights” framework:

- the right information
- in the right format
- at the right time
- within the right stage of the care pathway
- to the right individuals, including patients, clinicians and care teams

At present, significant challenges remain in bringing these algorithms fully to the point of care for maximal impact.

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### **Why Human Oversight Still Matters**

When we think about training the next generation of clinicians, we must ensure they continue to use their own clinical judgement, observation skills and decision-making processes.

One risk is that these technologies become so widely used that future clinicians over-rely on them.

It is therefore important that clinicians continue to develop their own diagnostic reasoning, communication skills and patient-centred clinical judgement.

These tools should augment clinical expertise, not replace it.

Clinicians must continue to focus on the individual patient in front of them while using AI as an additional support tool.

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## **Key Takeaways**

We are currently entering an exciting phase in which we have access to novel technologies such as AI-enabled scribes and increasingly sophisticated tools for analysing patient-generated data, electronic health records and other complex datasets.

The key challenge will be ensuring these technologies can be accessed and implemented efficiently in ways that genuinely improve patient care.

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## **Closing Statement**

### **Dr Marcello Moccia:**

Thank you, Dr Bove, for these excellent insights.

Artificial intelligence clearly has the potential to enhance how we detect and monitor progression in multiple sclerosis. However, its value depends on how effectively it is integrated into clinical practice.

In the final module, we will bring these insights together to explore how biological signals and clinical indicators can guide treatment decisions.