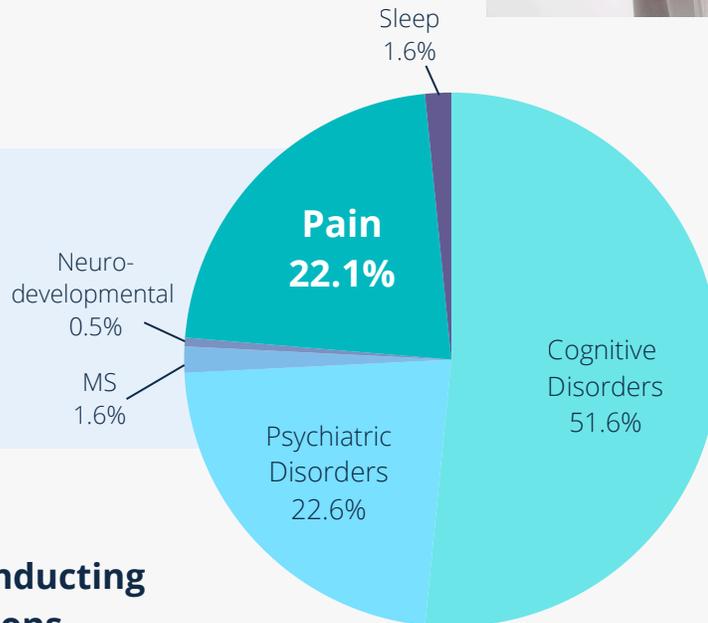




Pain Studies

74%
of all MAC studies
are in a CNS
therapeutic area

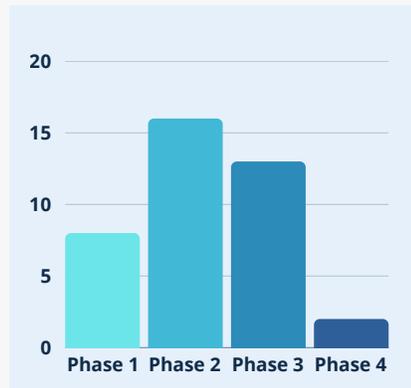
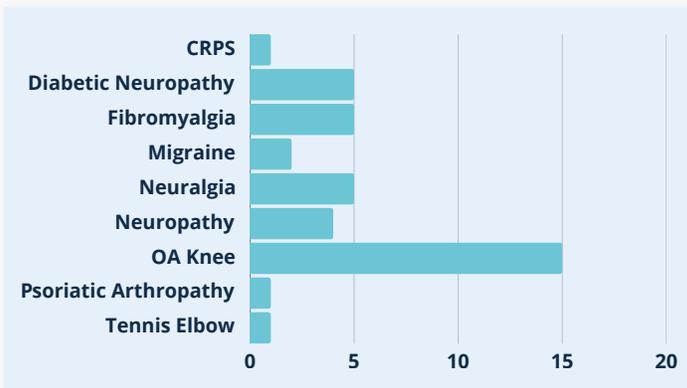
22.1%
of those are in
pain studies



We have extensive experience in conducting pain studies, covering many indications

- Complex Regional Pain Syndrome
- Osteoarthritis of the Knee
- Peripheral Neuropathy
- Fibromyalgia
- Psoriatic Arthropathy
- Diabetic Neuropathic Pain
- Migraine
- Tennis Elbow

We have conducted **39** Pain Studies



2.52
average number of
patients recruited per
site per month

We have also conducted additional studies using a pain compound in Healthy Volunteers, using human modelling techniques to induce pain symptoms.

Human Models of Disease

Symptoms of a particular disorder are induced under controlled conditions so that potential efficacy can be investigated under optimal conditions. These models are offered in early phase drug development studies of healthy volunteers, to provide researchers with early signals of the drug's efficacy.

Pain Models



Cold Pressor Test – The cold pressor test, also known as the cold pain test, has been shown to be a reproducible and sensitive measure of the effect of opiates and other centrally acting analgesics. In the test a subject's hand is immersed in cold water usually over the range of 1 to 3oC. The main outcome measures recorded are time hand can be immersed until the pain becomes intolerable and subjective scoring of perceived pain.



Thermal Stimulation – Peltier thermodes can be applied to the surface of the skin to deliver precise increases and decreases in skin temperature. This allows the effects of medication on hot/cold thermal thresholds and tolerance levels to be determined.



ID/Topical Capsaicin – Intradermal injection of capsaicin induces a localized release of substance P (neurokinin 1), calcitonin gene-related peptide (CGRP), and other neuropeptides, resulting in localized flare accompanied by pain, hyperalgesia, and allodynia. These effects are similar to those seen in neuropathic pain conditions; therefore, it is believed that this model may be useful in testing drugs with potential efficacy in this and other chronic pain states.



Migraine Induction – Induction of migraine allows the effects of potential anti-migraine treatments to be investigated under controlled, reproducible laboratory conditions. MAC has validated a model using glyceryl trinitrate (GTN) that can reliably induce a biphasic headache that patients report as being migraine-like. Compounds under development for prophylactic and acute migraine symptom relief can be investigated in the model.



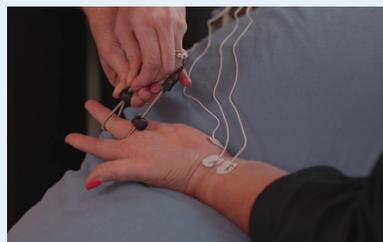
Mustard Oil – Topical administration of mustard oil induces a localized pain response, resulting in localized flare accompanied by pain, hyperalgesia and allodynia. These effects are similar to those seen in neuropathic pain conditions, and it is believed that this model may be useful in testing drugs with potential action on TRPM8 receptors.

Pain Assessments

Quantitative sensory testing

- Thermal thresholds/tolerance
- Pressure pain thresholds/tolerance
- Stimulus-induced pain
- Pain matching
- Hyperalgesia/allodynia

Nerve conduction



Our pain study experts



Dr John Connell
Chief Scientific Officer



Teresa Cullen
Clinical Sciences Manager

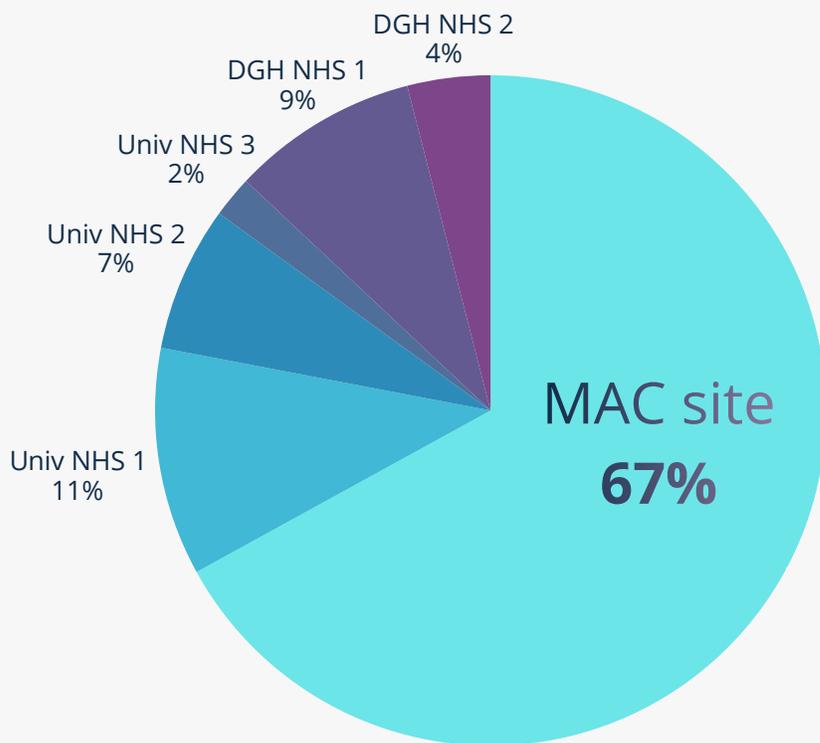


Jorge Costa
Head of Neuroscience

Case Study

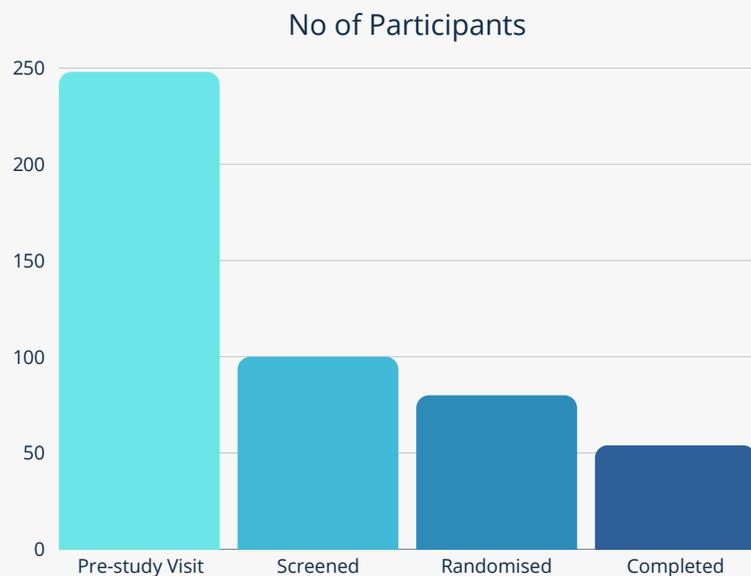
Osteoarthritis of the Knee

PARTICIPANT RECRUITMENT



MAC recruitment strategies generated **800** initial contacts for this study

MAC randomised **67%** of the total UK study population



MAC Clinical Research

- ✓ Over 30 years' experience in conducting clinical studies
- ✓ Full-service CRO with global reach
- ✓ 10 fully-owned research facilities in the UK
- ✓ Experts in healthy volunteer and patient recruitment



5-year summary

120+

SPONSORS

250+

STUDIES

50+

INDICATIONS

20+

FIH STUDIES

Our Services



CLINICAL RESEARCH SERVICES

Project Management

Clinical Operations

Site Monitoring
Site Management
Trial Feasibility

Pharmacovigilance

Regulatory Affairs

Biometrics

EDC
Data Management
SAS Programming
Biostatistics
Medical Writing

Vendor Management

Randomization and Trial Supply Management

Digital Solutions

Electronic Patient-Reported Outcomes (ePRO)
eConsent

Medical Monitoring



SITE & PATIENT SERVICES

Participant Recruitment

Participant Retention

Global Investigator Sites

Network of Fully-Owned Investigator Sites

Sleep Laboratory
Early Phase Unit
Psychedelic Testing Suites
Phase I - IV Research Facilities
Memory Assessment Research Centre



SCIENTIFIC SOLUTIONS

Human Models of Disease

Scientific and Endpoint Assessments

Cardiovascular Assessments
Cognitive and Neuropsychological Assessments
Dermatology Assessments
Imaging Assessments
Neurophysiology Assessments
Pain Assessments
Other Assessments

Clinical Procedures

Sleep Assessments

Psychodelics

Training



PHARMACEUTICAL SERVICES

GMP Manufacturing

In-House Pharmacy

Global Clinical Supplies

QP Services

IMP Management & Distribution

Controlled Drug Services

Laboratory Services

Clinical Pathology
Bioanalytical Services



STRATEGIC CONSULTANCY

Therapeutic Area Expertise & Study Development

Scientific Solutions & Pharmacodynamics

Clinical Science & Development

Medical Strategy, Input & Expertise

Statistical Analysis, Planning & Advice

Medical Writing

Laboratory Study Design, Methods & Conduct

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