

# CAREERS THROUGH MATHS: ONCOLOGIST



## JOB OVERVIEW

Oncologists are medical doctors who specialise in the diagnosis, treatment, and management of cancer. They work primarily in NHS hospitals, private healthcare facilities, and research institutions, leading multidisciplinary teams to provide patient-centred care. Their role is deeply mathematical, involving the analysis of clinical trial data, interpretation of complex medical imaging, and the calculation of precise drug dosages and radiation therapy plans based on statistical models of treatment efficacy and toxicity.

The work requires integrating patient-specific data—such as tumour size, growth rates, and genetic markers—with population-level statistics to make evidence-based decisions. Oncologists use mathematical reasoning to assess risk-benefit ratios, predict disease progression, and personalise treatment strategies to maximise survival rates and quality of life for their patients.

## KEY MATHS APPLICATIONS

**Primary Areas:**

## ESSENTIAL SKILLS & TOOLS

SKILL	APPLICATION
<b>**Statistical Software (R, SPSS)**</b>	Performing survival analysis and meta-analysis of clinical research data.
<b>**Clinical Decision Support Systems**</b>	Using algorithms that integrate patient data with clinical guidelines to recommend personalised treatment options.
<b>**Radiomics**</b>	Extracting quantitative features from medical images to predict tumour behaviour and treatment response.
<b>**Tumour Board Collaboration**</b>	Presenting and interpreting complex clinical and statistical data to a multidisciplinary team to reach a consensus on patient care.

## TYPICAL PATHWAY

The pathway begins with a medical degree (typically 5-6 years) from a UK university, followed by two years of foundation training as a junior doctor. Subsequently, applicants must complete core medical training (CMT) or acute care common stem (ACCS) for two years, before competing for a specialty training post in Clinical Oncology or Medical Oncology (lasting 5-6 years). This training leads to Membership of the Royal College of Physicians (MRCP) or Fellowships of the Royal College of Radiologists (FRCR). The entire process from medical school to becoming a Consultant Oncologist takes approximately 10-12 years.

## INDUSTRY DEMAND

Demand for oncologists in the UK is high and growing, driven by an ageing population and increasing cancer prevalence. NHS Long Term Plan commitments to improve cancer outcomes have intensified the need for specialists. However, many NHS oncology departments report significant workforce shortages and vacancies, creating a strong job market for qualified consultants. The field offers excellent job security and opportunities in both clinical practice and research.

## REAL-WORLD IMPACT

Oncologists directly impact patient survival and quality of life by translating complex mathematical and scientific data into life-saving treatments. Their work drives innovation in cancer care, contributing to the development of new therapies and personalised medicine. By applying statistical rigour, they ensure that treatments are both effective and evidence-based, ultimately reducing cancer mortality rates and shaping national health strategies.

QUICK FACTS

- **Growth:** Positive industry outlook
- **Career:** Professional role requiring analytical skills
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