

CAREERS WITH STEM™ JOB KIT

NUCLEAR MEDICINE SCIENTIST/ TECHNOLOGIST

Discover more about this
exciting career that saves lives

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Australian Government



DISCOVER MEDICAL SCIENCE CAREERS

Looking for a STEM job that not only combines science, technology, engineering, maths and medicine, but is in super high demand too? You've found it!

LEIGHTON ROGAN
NUCLEAR MEDICINE
SCIENTIST



THERE'S A HIGH DEMAND FOR NUCLEAR MEDICINE SCIENTISTS IN AUSTRALIA"

Hey there! I'm Leighton Rogan and I work in nuclear medicine. I used to be a nuclear medicine scientist myself, but now I'm a Regional Technical Manager for I-MED in the NSW Riverina. That means I manage a team of nuclear medicine scientists, radiographers and sonographers who work at different private clinics in my area. Even though most of my job these days is about managing people and services, I still love spending time in the nuclear medicine department.

Have you heard of nuclear medicine before? It's a really interesting (and important!) field that uses small amounts of radioactive materials to create images of the inside of the body to diagnose diseases. We use these materials, called tracers or radiopharmaceuticals, to see how different organs and tissues – like bones, lungs, the brain, heart, kidneys, liver and thyroid – are functioning in the

body. We can also use nuclear medicine to deliver very targeted treatments, usually for cancer.

There's a high demand for nuclear medicine scientists in Australia, and the field is growing faster than the number of graduates. That's why we've created this Job Kit – packed with helpful information, including real-life career profiles and industry insights – to inspire the next generation of nuclear medicine scientists or technologists.

Check it out to learn more about what it's like to work in nuclear medicine and see if it's the right career for you!

Leighton Rogan
Regional Technical Manager
I-MED Radiology Network (Riverina)

**BACHELOR OF APPLIED SCIENCE
(NUCLEAR MEDICINE TECHNOLOGY)**

GRADUATE CERTIFICATE (PET/MRI)

**NUCLEAR MEDICINE SCIENTIST,
NSW HEALTH**

**CHIEF NUCLEAR MEDICINE TECH.
I-MED RADIOLOGY NETWORK**

**REGIONAL TECHNICAL MANAGER,
I-MED RADIOLOGY NETWORK (RIVERINA)**

Check out CareerswithSTEM.com for more insights, information, inspiration and advice about Nuclear Medicine careers!

ATOMIC AMBITION

MEET TWO GRADS MAKING THEIR MARK IN THE WORLD OF NUCLEAR MEDICINE

#1

STEPHANIE ROBBIE
NUCLEAR MEDICINE SCIENTIST
QUEENSLAND X-RAY

THERE ARE
AMAZING CAREERS
AVAILABLE WITHIN
THE NUCLEAR
MEDICINE INDUSTRY"

In high school, Stephanie loved sport and science, but she didn't consider herself to be "very academic". She left school in Year 10 to pursue tennis, but when this fell through, she completed a diploma to get into university.

"When it came time to decide on a career path, nuclear medicine seemed pretty cool," Stephanie says. Nuclear medicine appealed for the balance it offered between science and patient interaction and care.

Now working at Queensland X-Ray, Stephanie has overcome any initial doubts about her ability to go to university, and has excelled in her career. She enjoys the constantly evolving field of nuclear medicine and the opportunity to adapt to individual patient needs. In the future, Stephanie hopes to pursue a PhD in nuclear medicine and potentially teach at the university level.

"There are amazing careers available within the nuclear medicine industry," Stephanie says. "Don't feel like you have to follow the 'normal' path – there are many ways to get where you want to go."

DIPLOMA OF TERTIARY PREPARATION

BACHELOR OF MEDICAL RADIATION SCIENCE (NUCLEAR MEDICINE AND MOLECULAR IMAGING)

NUCLEAR MEDICINE SCIENTIST, QUEENSLAND X-RAY

Jessica always knew she wanted to work in the healthcare field, but she never expected to find her calling in nuclear medicine. While researching careers for a high school assignment, she discovered the Bachelor of Medical Radiation Science program, which included a specialisation in nuclear medicine. Intrigued by the combination of science and patient care, Jessica decided to pursue this degree and recently graduated.

Now working as a nuclear medicine scientist with Tasmania's I-MED Regional Network, Jessica uses her skills and qualifications to run diagnostic scans on patients. She is also enrolled in a Master of Advanced Medical Radiation Practice, which she will complete part-time while working full-time.

Jessica believes nuclear medicine doesn't have the profile it deserves, and she encourages other young people interested in healthcare to consider it as a career option.

"Nuclear medicine scientists are highly sought after because there are not many of us and there are a multitude of job opportunities, which is great for new graduates," she says.

#2

JESSICA WHITEHOUSE
NUCLEAR MEDICINE SCIENTIST
I-MED RADIOLOGY NETWORK

NUCLEAR
MEDICINE SCIENTISTS
ARE HIGHLY SOUGHT
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BACHELOR OF MEDICAL RADIATION SCIENCE (NUCLEAR MEDICINE AND MOLECULAR IMAGING)

NUCLEAR MEDICAL SCIENTIST, I-MED RADIOLOGY NETWORK, TASMANIA

Molecular medicine... Putting the MM in STEM

Want a challenging and rewarding STEM career that's in high demand? Nuclear medicine scientists use cutting-edge tech to save lives – and we need more people skilling up in this crucial career!

Nuclear medicine scientists use small amounts of radioactive materials and high-tech specialised equipment to diagnose and treat disease. This is a rewarding, in-demand STEM career that combines the humanities of patient care and the sociology of health with cutting-edge science and medical technology.

THE INSIDE STORY

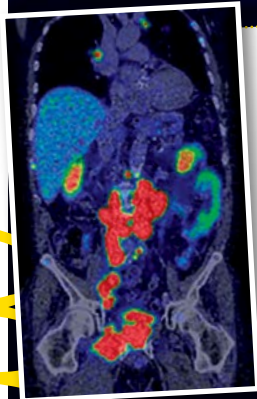
Nuclear medicine scientists use radiopharmaceuticals to diagnose and treat diseases. Here is some of the technology they use to look inside the human body:

- A **gamma camera** is a device that uses a type of radiation called gamma rays, a kind of high-energy photon that can be used to produce functional images of organs and tissues inside the body. This type of imaging is often used to diagnose conditions such as cancer and disorders of the heart, brain, kidney, lung, bone and many other organs.
- **SPECT** stands for Single Photon Emission Computed Tomography. SPECT scans enable three-dimensional functional imaging, providing high-resolution 'slices' for viewing organs from multiple angles.
- **PET** stands for Positron Emission Tomography. PET scans use special tracers that allow high resolution three-dimensional imaging of function at the cellular or molecular level.

THE CT COMBO

Interested in radiography? Nuclear medicine scientists are qualified in CT too!

Most commonly today, SPECT and PET scanners are combined with CT or MRI in what are called hybrid scanners. While nuclear medicine imaging provides highly sensitive mapping of how tissues or organs are functioning, hybrid scanners allow simultaneous imaging with high resolution anatomical imaging using CT or MRI. Combining both can provide a more complete picture of what is going on inside the body for better treatments and diagnoses.



CAREER COMPARISON

NUCLEAR MEDICINE SCIENTIST, RADIOGRAPHER AND RADIATION THERAPIST ARE SIMILAR JOBS, BUT THERE ARE SOME IMPORTANT DIFFERENCES!

The job	In a nutshell	Study pathways	Technology used
Nuclear medicine scientist (sometimes known as nuclear medicine technologist)	Uses medical imaging equipment to look inside the body at both function and structure. They work with materials containing small amounts of radiation, called radiopharmaceuticals and radionuclides, to diagnose and treat disease.	<ul style="list-style-type: none"> • Bachelor's degree in medical radiation science, majoring in nuclear medicine • Bachelor's degree in applied science, majoring in nuclear medicine • Bachelor's degree in nuclear medicine or nuclear medicine science. 	<ul style="list-style-type: none"> • Radiopharmacy equipment • Gamma cameras and other imaging devices • SPECT, PET, CT and MRI and hybrid scanners • Ultrasound
Radiographer	Uses imaging equipment including X-ray to create structural pictures of the inside of the body to diagnose medical conditions.	<ul style="list-style-type: none"> • Bachelor's degree in medical radiation science, majoring in diagnostic radiography • Bachelor's degree in applied science, majoring in diagnostic radiography • Bachelor's degree in diagnostic radiography or medical imaging 	<ul style="list-style-type: none"> • X-ray machines • CT scanners • MRI scanners • Ultrasound
Radiation therapist	Uses radiation to treat cancer and other diseases.	<ul style="list-style-type: none"> • Bachelor's degree in medical radiation science, majoring in radiation therapy • Bachelor's degree in applied science, majoring in radiation therapy • Bachelor's degree in radiation therapy 	<ul style="list-style-type: none"> • Linear accelerators • Brachytherapy machines • Treatment planning software

Where you could work

- ✓ Hospitals ✓ Clinics
- ✓ Research facilities
- ✓ Imaging centres
- ✓ Cancer centres

Typical tasks

- Operating imaging equipment
- Preparing and administering radioactive materials for diagnosis or therapy
- Computer analysis and measurement
- Communicating with patients and doctors
- Positioning patients
- Reviewing medical images and patient history
- Monitoring patients' health
- Instrument quality control

FACT FROM FICTION

WE BUST THE MYTHS AND SHOWCASE THE FACTS ABOUT CAREERS IN NUCLEAR MEDICINE

#1

Fiction: You need to be top of your class in physics and chemistry for this job

You don't need to have studied physics or chemistry at high school to become excellent in a nuclear medicine career. In this job you will learn some physics but mostly about the fundamentals of instrumentation and radiation safety. You won't be using chemistry but will learn about radiopharmaceuticals and pharmacology. Of course, STEM skills are transferable and studying physics and chemistry will make you a better problem-solver no matter your career path!



#2

Fact: 'Nuclear' is safe

'Nuclear' isn't always scary – in fact it can be life-saving! Although there is radiation involved in the nuclear medicine procedures, the amounts are well within safe limits. In fact, the radiation exposure from background sources is often higher in the northern hemisphere than the combined radiation dose from both the job and background in Australia! So, while it is important to respect the radiation involved in nuclear medicine, it is also important to remember that it is a safe and effective way to diagnose and treat medical conditions.



#3

Fiction: You'll only work in a hospital

Many nuclear medicine scientists work in public hospital departments but others work in the private sector. The private sector can include private hospitals, contracts in public hospitals and in private clinics or medical centres. Others work in research facilities or in veterinary imaging. Some go into ultrasound or MRI training positions, some decide to work for commercial companies in sales or applications training, and it is also a fantastic foundation degree for those wanting to do graduate-entry medicine. Wherever you work, job security is high!

#4

Fact: The job is very diverse

On any given day, a nuclear medicine scientist uses their skills in radiopharmacy, patient care, imaging, data analysis and more. It is a fast-paced and exciting job which will require you to be versatile and adaptable. Nuclear medicine scientists can also become more specialised in one area (e.g. radiopharmacy); especially in larger departments. It's also a career where diversity and equity are strongly reflected in the workforce.



#5

Fact: You can work overseas

Australian nuclear medicine scientists are highly regarded internationally and many take advantage of that to have working holidays for a few years early in their career. The UK is particularly popular as a place to work while exploring Europe for a few years, but Australian graduates are also employed widely across New Zealand. Some universities also offer international experiences for students; undertaking one or more of your clinical rotations in an international department.

NEVER HEARD OF NUCLEAR MEDICINE SCIENCE? NEITHER HAD THESE TWO EXPERTS – NOW THEY’RE CELEBRATED LEADERS IN THE FIELD, WITH REWARDING AND SUCCESSFUL CAREERS

#1

GEOFF CURRIE HAD HIS SIGHTS SET ON A CAREER IN RADIOGRAPHY – UNTIL A RADIOGRAPHER SET HIM ON A DIFFERENT PATH, AND HE HASN’T LOOKED BACK

In high school I wanted to become a radiographer – I even volunteered at my local hospital’s X-ray department. Then I finished Year 12 and the chief radiographer suggested I might find nuclear medicine more challenging and interesting.

I knew what radiography was but I’d never heard of nuclear medicine! Then I visited a nuclear medicine department and was an instant convert.

I’m still in the field 35 years later and love it. I’ve worked and taught all over the world and co-founded an organisation called RAINS that represents nuclear medicine professionals across Australia and New Zealand. It’s grown to have the largest membership of nuclear medicine scientists in Australia!

Now, I spend my time teaching the next generation of nuclear medicine scientists and undertaking cool research at Charles Sturt University. I was even awarded an Order of Australia and was the first person outside the USA to be awarded a fellowship in the SNMMI-TS (Society of Nuclear Medicine & Molecular Imaging Technologist Section).

“I KNEW WHAT RADIOGRAPHY WAS, BUT I’D NEVER HEARD OF NUCLEAR MEDICINE!”



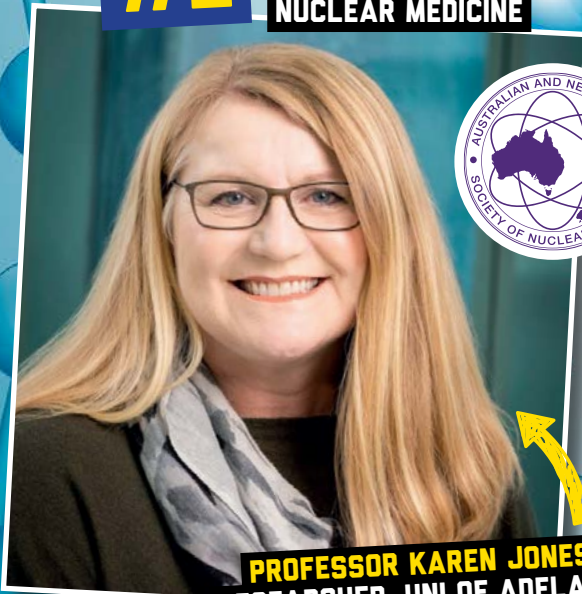
PROFESSOR GEOFF CURRIE AM
CHARLES STURT UNIVERSITY
CO-FOUNDER, RAINS

SHUTTERSTOCK



#2

KAREN JONES WASN’T SURE WHAT SHE WANTED TO DO AFTER SCHOOL. SHE WENT ON TO BECOME A LEADER IN THE FIELD OF NUCLEAR MEDICINE



PROFESSOR KAREN JONES
RESEARCHER, UNI OF ADELAIDE
VICE PRESIDENT, ANZSNM

Research tells us 43% of Year 12 students don’t know what they want to do when they finish school. I was one of them. I did know that I liked maths and science, was interested in health and wanted to work with people. One of my teachers suggested a career in radiography, so I studied a degree that encompassed radiography, nuclear medicine and radiation therapy. Nuclear medicine was new to me, but I loved the diversity of the field.

Joining the ANZSNM (Australian & New Zealand Society of Nuclear Medicine) helped me appreciate the importance of different types of healthcare professionals working together in nuclear medicine. I’ve been involved with the organisation throughout my career – which has spanned four decades! – and I am now Vice President.

I am so lucky to have been able to work in clinical practice, education and research. I was even the first nuclear medicine technologist in Australia to complete a PhD! I am passionate about nuclear medicine and teaching the nuclear medicine workforce of tomorrow.

“NUCLEAR MEDICINE WAS NEW TO ME, BUT I LOVED THE DIVERSITY OF THE FIELD”



A day in the life of a... NUCLEAR MEDICINE SCIENTIST

Luke Kissane uses state-of-the-art technology to change or save the lives of patients every day

Luke is a nuclear medicine scientist at I-MED Radiology Network in Wagga Wagga, where he's worked for more than five years. He completed a Bachelor of Medical Radiation Science (Nuclear Medicine) and is passionate about his job and using his skills to help others.

"It is fantastic to use my people skills to help patients and my science skills with technology in such a diverse role," he says.

Before working at I-MED, Luke was recruited straight out of university as a nuclear medicine scientist at one of New Zealand's biggest imaging centres, Mercy Radiology. Luke also has leadership ambitions and is studying a Master of Health Leadership and Management.

This is what an average day in his job might look like:

Early shift 7am

The day starts before patients arrive – the radiopharmaceuticals we administer to patients need to be prepared. Mixing the chemicals is an important and fun part of the day but the hard chemistry is already done – a bit like shake-and-bake pancakes!

IT IS FANTASTIC TO APPLY PEOPLE SKILLS TO PATIENT CARE AND SCIENCE SKILLS TO TECHNOLOGY IN SUCH A DIVERSE ROLE"

8am

All of the equipment needs to be calibrated to ensure accurate imaging and analysis. This is really important given most of our imaging equipment is hybrid – meaning it has nuclear medicine and CT devices in one scanner.

8.30am-3.30pm

Patient scanning! Some are quick and simple, others need to be imaged at more than one time point, and some need other interventions like exercise or medications.

Most scans involve injecting our radiopharmaceutical into a vein but sometimes it is breathed in, swallowed or injected in another way. I prepare the dose in the radiopharmacy and administer it. A key part of that is communicating with the patient, taking

their history, answering questions and making them at ease.

Scanning involves positioning the patient and operating the equipment. Afterwards, images need to be processed and often we run cool programs to get even more information.

3.30pm

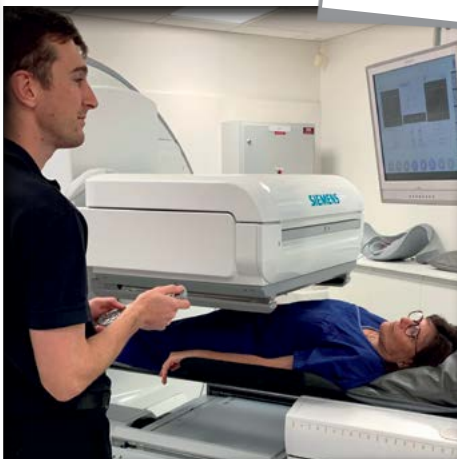
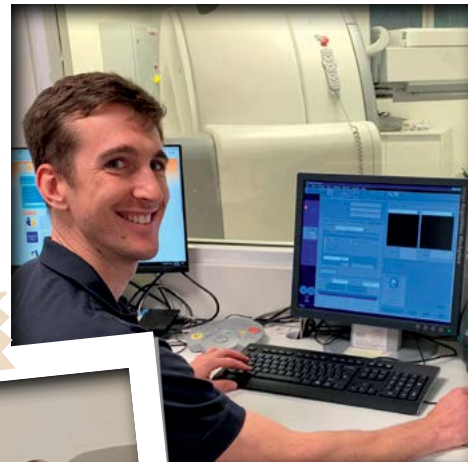
This is usually when I head home – feeling pretty good about helping so many patients! But on busy days I stay to help scan and analyse data.

Late shift

On late shifts I work from 9am to 5pm, but I'm also available for any late or urgent scans.

After hours

Our team rotates being on-call so we are available for any urgent scans.



SENIOR NUCLEAR MEDICINE TECHNOLOGIST, I-MED RADIOLOGY NETWORK

NUCLEAR MEDICINE SCIENTIST, MERCY RADIOLOGY, NZ

BACHELOR OF MEDICAL RADIATION SCIENCE (NUCLEAR MEDICINE)

Get the job!

Inspired to become a nuclear medicine scientist?
Here's how to kickstart your career path... starting now!



TUBE-TORIALS

We've compiled a playlist of top videos all about nuclear medicine science careers – start watching and learning!
bit.ly/nuclear-playlist

FILL YOUR FEED



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@discoverANSTO
@women_in_nuclear_medicine
@nucmedtr



- ANSTO | Lucas Heights NSW
- Australian & New Zealand Society of Nuclear Medicine
- Rural Alliance In Nuclear Scintigraphy (RAINS)

STUDY PATHWAYS

To become a nuclear medicine scientist you have to complete an approved uni degree in nuclear medicine. The degree must be accredited by Ahpra and graduates must register with Ahpra to practice. To get into these courses you usually need to achieve the appropriate ATAR but there are other pathways including early entry and mature age entry.

Here's where you can study approved nuclear medicine science courses:

- Charles Sturt University (Wagga Wagga or Port Macquarie campus)
- Royal Melbourne Institute of Technology
- University of South Australia
- University of Newcastle

Nuclear numbers

700,000 the number of lives saved or changed every year by nuclear medicine in Australia

\$67,400 the average starting salary for a nuclear medicine scientist (excluding super)

10% Annual growth of the nuclear medicine workforce

CHOOSE THIS CAREER IF YOU:

- ✓ Love cool science and technology
- ✓ Have an interest in health science
- ✓ Have good communication skills and compassion
- ✓ Like attention to detail and take pride in your work
- ✓ Adapt to dynamic and innovative environments
- ✓ Are organised
- ✓ Can work both independently and in a team
- ✓ Want to help people and use science to improve their outcomes
- ✓ Think outside the box and can problem-solve

Electives checklist

Prerequisite subjects vary between universities and English proficiency is the only assumed knowledge. Maths, biology and physics could help you transition through first year at uni, but are generally not required.