Australia: Infrastructure and Innovations for Clinical Trials

Second in a Three-Part Series

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Sponsors seeking venues for pharmaceutical research and development would do well to consider Australia – offering a highly favorable, stable environment and experienced, capable local expertise. This article is the second in a three-part series: Here, we examine the landscape for clinical trials, including infrastructure, government funding support and incentives, patient-centricity, patient recruitment, and the adoption of innovation.

Australia has a strong reputation for the quality of its scientific and medical research. It is internationally recognized for its highly trained clinical workforce and the high-quality data produced by its research teams. The combination of this scientific and medical expertise means that Australia can provide good value for the clinical development of protocols and trial execution. Australia is especially attractive for Early Phase trials (Phase I and II) thanks to a diverse participant recruitment pool, established First in Human (FIH) Phase I centers, sound infrastructure, and fast start-up timelines.

Australia has more than 200 clinical trial sites comprising public and private hospitals, clinics, general medical practices, and dedicated clinical trial centers.[1] Australian clinical research sites have state-of-the-art facilities with equipment for testing, treatment, and analysis, conducting trials within a strong regulatory framework underpinned by the principles of ICH GCP.

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Roughly 30% of clinical trials commenced in 2019 in Australia have sites in Victoria, and a similar proportion of trials have sites in New South Wales (NSW). Sites in Queensland comprise 21% of trials, and Western Australia and South Australia sites represent 15%. The distribution of clinical trials by state can be explained by the fact that Victoria and NSW have the largest proportions of Australia's population and traditionally have had the soundest clinical trials infrastructure. This includes some of the country's biggest teaching hospitals and specialist cancer treatment centers. Parexel has long-term relationships with several sites in Australia as part of our site alliance partnership, including large teaching hospitals, private oncology networks, and Phase 1 units. The Site Alliance Manager is a dedicated resource collaborating with alliance sites, thereby simplifying site selection and ensuring reliable study delivery and a patient-centric approach.

After the outbreak of COVID-19, the Australian government firmly committed to continued investment in medical technology, biotechnology, and pharmaceuticals, encouraging research and development, clinical trials, innovation, and manufacturing. Due to Australia's relatively good management of COVID-19, clinical trials continued to be launched during the pandemic. For example, the number of oncology clinical trials in 2020 increased by 2% over the previous year.[2]

Early Phase Trials

There has been a significant increase in Early Phase trials since 2018, but these decreased in 2022, reflecting a global trend.

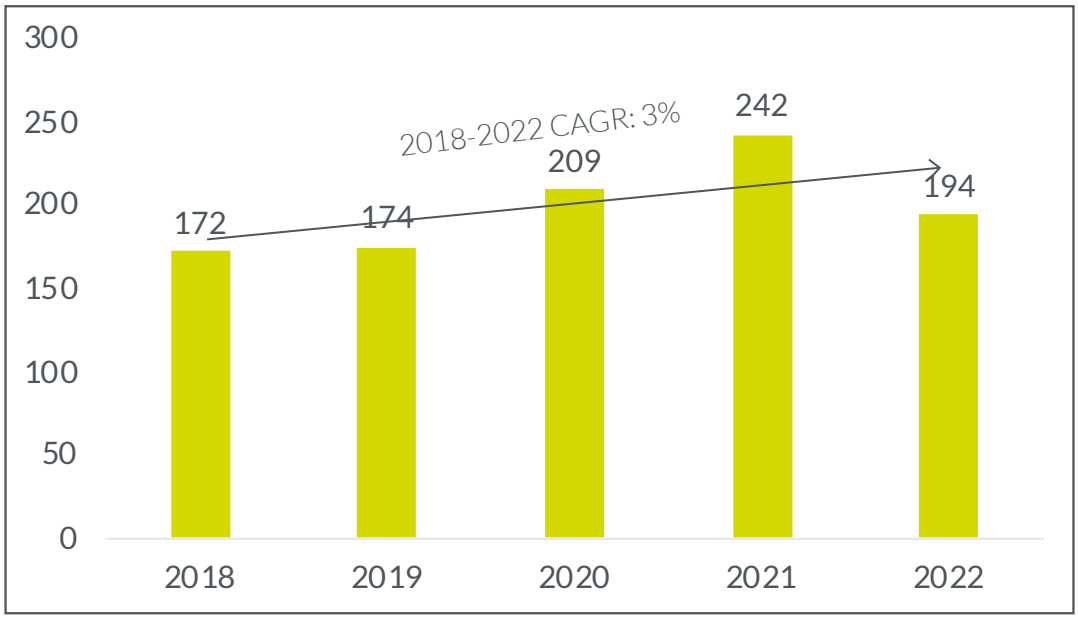

Figure 1: Number of Early Phase Trials Conducted in Australia (ANZCTR)[2]

There are five Phase I units in Australia: Nucleus Network (two sites), Scientia Clinical Research, CMAX, and Linear Clinical Research Limited (see table below). Nucleus Network and Scientia Clinical Research are both part of Parexel's site alliance network. These five units are co-located with large academic hospitals and run healthy volunteer FIH trials in Australia, performing more than 100 Early Phase trials per year. Some of these units have ethno-bridging capabilities.

Table: Five Phase I Units in Australia

Name	# Beds	Location	Associated Hospital	Volunteer Database	Experience
Nucleus	80 62	Melbourne Brisbane	Alfred Hospital Royal Brisbane and Women's Hospital	75,000	700 Phase I clinical trials over past 15 years
CMAX	55	Adelaide	Nearby Royal Adelaide Hospital	>30,000	>600 trials over past 26 years
Linear	30	Perth	Sir Charles Gairdner Hospital	>28,000	› 300 Early Phase trials › Capabilities in First-in-Human oncology trials
Scientia	30	Sydney	Nearby Prince of Wales Hospital	> 20,000	› Newest center (operational June 2017) for Early Phase trials, government funded › Capabilities in First-in-Human oncology trials › Number of trials since opening: >80 -Majority in FIH trials -Approximately 50/50 healthy subjects/ patients

Meanwhile, there are many specialist bioanalytical labs in Australia that support clinical trials. TetraQ, CPR, 360 Biolabs, and Nexomics are specialist bioanalytical labs with expertise in PK/PD analysis, ADA, biomarker, bioanalytic, and toxicology services.

Despite the relatively simple regulatory review process in Australia, some companies encounter challenges opening FIH studies. These issues typically arise because of the innovative mechanisms of action, complex clinical procedures, comprehensive safety measurements needed, or issues involving their preclinical data. Parexel has supported many companies by reviewing and commenting on their preclinical data, designing the appropriate safety and pharmacodynamic endpoints in the FIH studies to ensure smooth study conduct in Australia. In many cases, we work closely with scientific and clinical teams from our Australian partners' Early Phase sites to provide global standard scientific and operational support.

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Specifically, Parexel's extensive global experience in early clinical development supports clients from different regions in running trials in Australia and in subsequent global development. For many biotech companies, starting FIH trials in Australia is generally the first important step, enabling them to leverage high-quality data for starting Phase 1b/2a studies in other regions. They rely on Parexel's comprehensive knowledge of both preclinical and clinical development, as well as our experience working with agencies from different areas including NMPA, EMA, FDA.

Australia's Tax Incentives

Australia has an attractive tax incentive policy for clinical trial R&D. The R&D tax incentive[3] aims to boost competitiveness and improve productivity across the Australian economy by:

- Encouraging industry to undertake R&D that may not otherwise have been conducted
- Improving the incentives for smaller firms to undertake R&D
- Providing business with more predictable, less complex support

Australia's research and development tax incentive provides targeted tax offsets. The incentive has two core components. Entities engaged in R&D may be eligible for:[4]

- A 43.5% refundable tax offset for eligible entities with an aggregated turnover of less than AU$20 million per annum, provided they are not controlled by income-tax–exempt entities
- A 38.5% non-refundable tax offset for all other eligible entities (entities may be able to carry forward unused offset amounts to future income years)

Some Australian enterprises need to rely on overseas experience and resources. If the expenses incurred in Australia account for more than 50% of the total expenses, sponsors can also apply for R&D tax incentives by providing supporting evidence.

Parexel helps sponsors navigate the R&D tax incentive in a number of ways. For example, we link them to organizations that can support setting up a local entity, and provide estimates and breakdown of applicable service fees and pass-through costs.

Government Funding Support (Medical Research Future Fund)

On April 4, 2022, the Ministry of Health of Australia released the budget for health and medicine from 2022 to 2023, of which the largest allocation was AU$6.3 billion for the Medical Research Future Fund (MRFF) to implement its second round of a 10-year funding plan.[5] Launched in 2015, MRFF is a long-term funding plan to support research and innovation in the health and medical fields in Australia. The second-round plan provides flexibility for the MRFF to continue to be responsive to emerging health challenges while maintaining focus on addressing key health challenges. The plan continues a strong focus on funding activities that aim to stimulate health and medical research across the entire R&D, translation, and commercialization pipeline.

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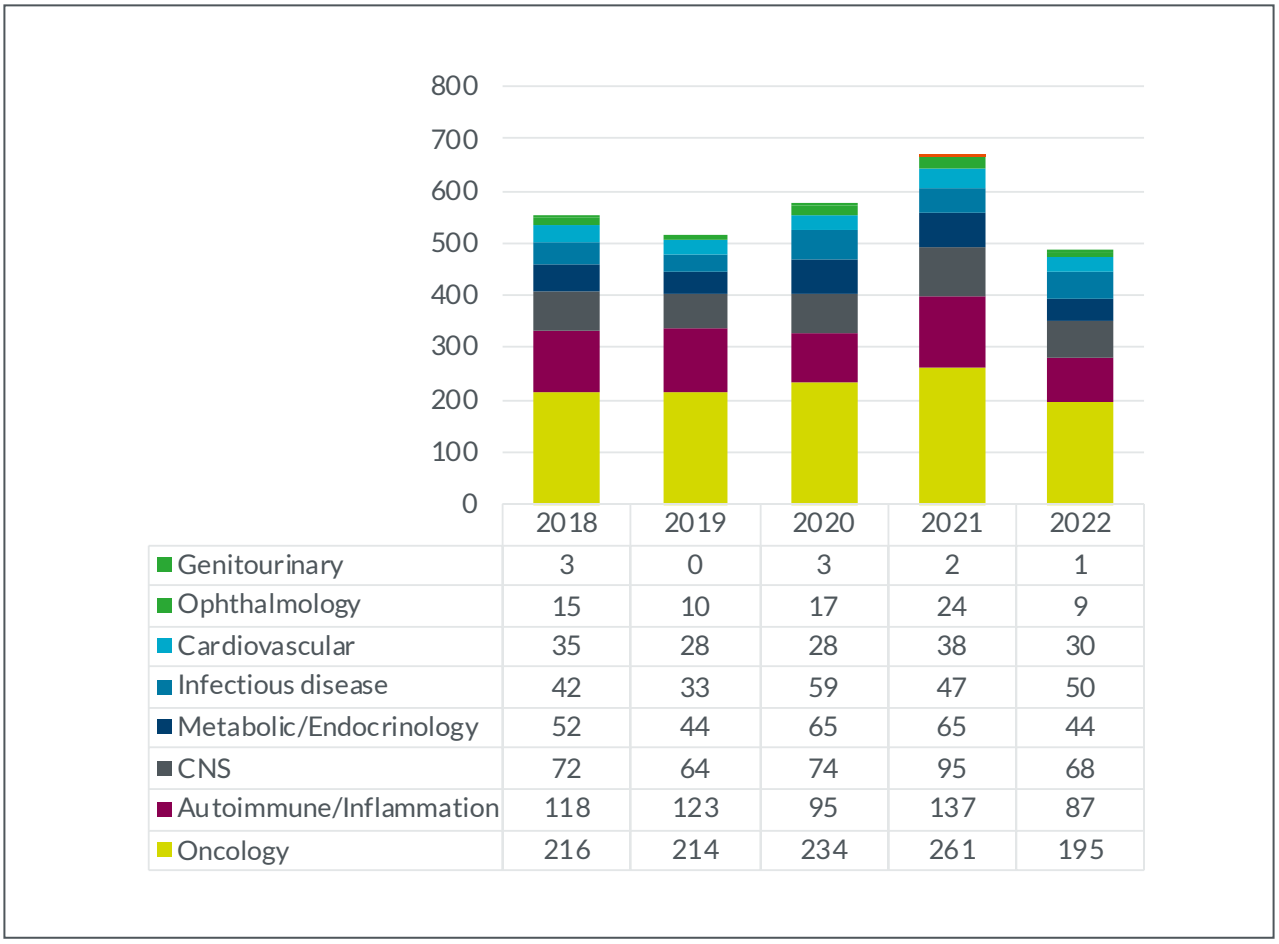
Therapeutic Areas of Study

In Australia, clinical trials mainly focus on oncology and autoimmune/inflammatory fields, accounting for almost half of the number of clinical trials in the past five years. (Figure 2)

Industry sponsored clinical trial activity 2018-2022 by therapeutic area in Australia (No. of trials)



	2018	2019	2020	2021	2022
Genitourinary	3	0	3	2	1
Ophthalmology	15	10	17	24	9
Cardiovascular	35	28	28	38	30
Infectious disease	42	33	59	47	50
Metabolic/Endocrinology	52	44	65	65	44
CNS	72	64	74	95	68
Autoimmune/Inflammation	118	123	95	137	87
Oncology	216	214	234	261	195

Figure 2: Clinical Trials Trend in Australia, 2018–2022[6]

According to the latest available data from the Australian Institute of Health and Welfare (AIHW), cancer accounts for one-fifth of the disease burden in Australia. Because of the aging population, the increase in the diagnosis of cancer has driven the market for oncology clinical trials.

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The Australian oncology market share based on cancer type is segmented into breast, lung, kidney, liver, ovarian, prostate, skin, pancreatic, colorectal, blood, and others (Figure 3).

This market is estimated to reach US$3.1B by 2026 at a CAGR of 17% over the 2021-2026 forecast period.

Australia Oncology Market Share- By Cancer Type (%) for 2020

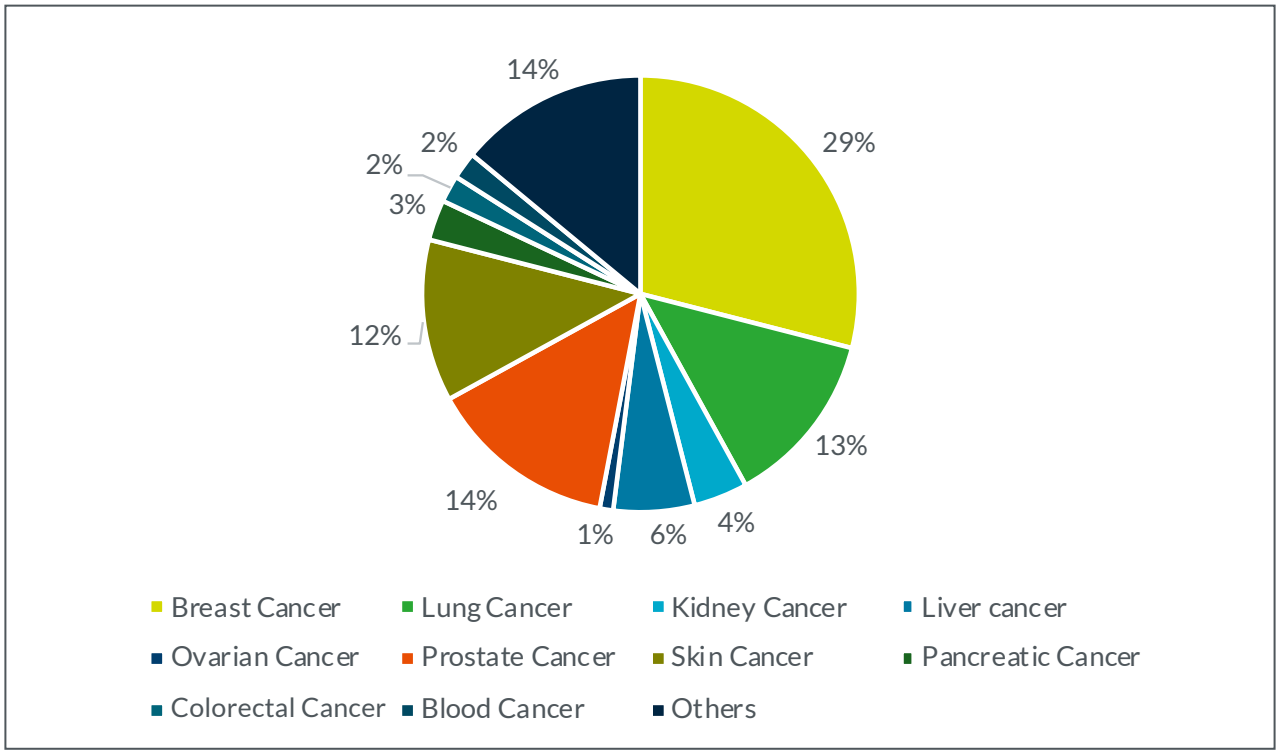

Figure 3: Australia Oncology Market Share by Cancer Type (%) for 2020[7]

The types of tumor treatment include drug therapy, radiotherapy, and surgical treatment. At present, drug therapy (including chemotherapy, immunotherapy, and hormone therapy as practical tools to treat cancer) occupies a leading position in the market. However, there are challenges. The number of patients participating in clinical research in Australia is relatively consistent with other markets. As an example, approximately 5% of adult patients diagnosed with cancer enroll in oncology trials.[7] Efforts are underway across the industry to improve patient centricity and to employ digital technologies to ease their burden. For instance, Parexel's experts employ patient insights and guidance from patient advocacy groups as well as best practices in real-world evidence to design patient-friendly trials that stand up to regulatory and payer scrutiny. Sometimes this involves a decentralized or hybrid approach. But because every patient population is unique, we've found it's critical to fully understand the patient as a person and design an experience that addresses their needs as completely as possible.

Toward Patient Centricity: Innovations in Australia

Patient Access and Recruitment

As in other markets, information and advice about clinical trials is not widespread in the general population and even among many clinicians. Multiple initiatives have been undertaken by government organizations (e.g., the Australian National Health & Medical Research Council (NHMRC) "Helping Our Health" campaign), not-for-profits, and patient advocacy groups to raise awareness about the role and value of clinical trials among consumers and clinicians in Australia. Organizations such as Research4Me and the White Coats Foundation have run numerous programs and events to raise awareness of clinical trials among consumers and patients in Australia.

In addition, platforms such as Australian Clinical Trials, managed by the Australian Commonwealth Department for Health and Aged Care, and Clin Trial Refer App, help consumers to better obtain information about clinical trials and thereby improve the efficiency of patient recruitment.

Artificial intelligence (AI) is proving to be a powerful tool in driving efficiency in patient recruitment. Leveraging the increasing amounts of medical data from EMR, devices, and health apps, researchers are turning to AI to screen and recruit patients:

- **ClinTrial Refer** connects patients, doctors, and clinical trial sites through a mobile app with the aim of increasing patient participation in clinical trials via clinical trial networks. The Australia-centric app provides a portal for consumers to search for relevant trials by discipline, therapeutic area, and other criteria.[8]
- Digital technologies such as Australia-based **Opyl** uses AI to provide social media insights and recruitment services. Opyl's recruitment platform, Opin, empowers patients active on social media and the Internet who may be searching for health information and research opportunities related to their condition. They can use Opin to identify and express interest in any registered clinical trial or research study anywhere in the world. Opin used AI to match patients and volunteers to clinical trials by medical condition, location, and distance to travel.[9]

Decentralized Trials, Including Tele-Trials, in Australia

Advances in technology have given rise to Decentralized Clinical Trials (DCTs), executed through telemedicine and mobile/local healthcare providers, allowing subjects to participate in clinical trials at home or in the location of their choice. Many pharmaceutical companies have embraced DCT as a strategy for clinical drug research and development. From the patient's perspective, the increasing use of telemedicine has raised their expectations for the experience of clinical trials. Against the backdrop of the COVID-19 pandemic,

which accelerated changes across the biopharmaceutical industry, DCT trials will continue to evolve and remain a critical path in the future.

Australia has made significant investments in establishing an appropriate clinical trials infrastructure for tele-trials, one of many mechanisms through which a decentralized trial can be implemented. Development of operational protocols for tele-trials have accelerated, leading to greater capability for DCTs. Tele-trials and digital technologies will continue to increase the number of patients who can be recruited, managed, and retained per site. This in turn will help drive down the cost per patient over the long term (despite higher initial costs). More information on the guidelines and setup of the tele-trial model can be found on the Medicines Australia webpage.[10]

For our part, Parexel has successfully worked with regulatory agencies across States set up a DCT for a rare disease oncology indication. Patients have thus been given access to much-needed treatments remotely without the need for the sponsor to set up a full new site in each State.

The next article in this series examines the regulatory affairs and reimbursement environment in Australia, covering:

- Clinical trial start-up processes
- The regulatory pathway
- Market access
- Pricing system and pricing control, with particular emphasis on cell and gene therapy

About Parexel: At the Heart of Getting Medicines to Those Who Need Them

Parexel is among the world's largest clinical research organizations (CROs), providing the full range of Phase I to IV clinical development services to help life-saving treatments reach patients faster. Leveraging the breadth of our clinical, regulatory, and therapeutic expertise, our team of more than 20,000 global professionals work in partnership with biopharmaceutical leaders, emerging innovators, and sites to design and deliver clinical trials with patients in mind, increasing access and participation to make clinical research a care option for anyone, anywhere.

In the past five years, our team in Australia has supported more than 300 clinical trial notification (CTN) submissions and nearly 400 clinical projects, offering expertise in regulatory consulting, clinical operations, and market access. These include more than 100 projects in oncology.

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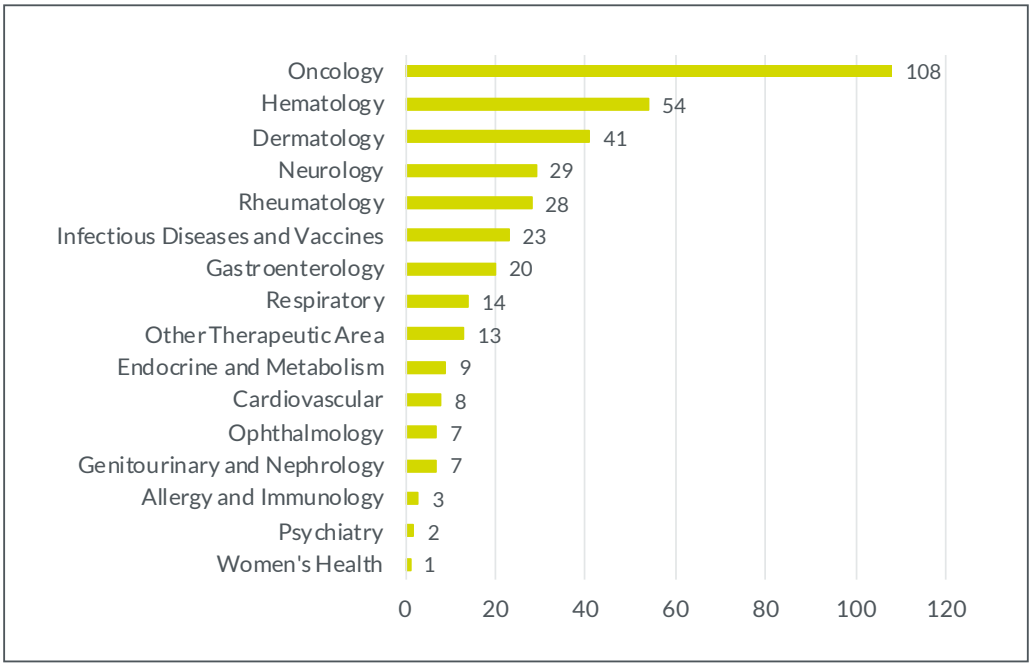
Parexel worldwide project experience
Region - Australia all projects - past 5 years (as of 13-Apr-2023)



Parexel is an accredited organization in Australia with the Office of Gene Technology Regulatory (OGTR) and can help our clients with the application for the GMO license needed to import GMOs. Moreover, Parexel has supported clients with over 290 cell and gene projects globally. Our staff comprises more than 30 cross-functional cell and gene therapy experts, including former regulators, who offer support with regulatory strategy, medical and clinical expertise, clinical logistics, and GxP compliance.

Our depth of industry knowledge and strong track record gained over the past 40 years is moving the industry forward and advancing clinical research in healthcare's most complex areas, while our innovation ecosystem offers the best solutions to make every phase of the clinical trial process more efficient. With the people, insight, and focus on operational excellence.

1 Citeline Trials | Citeline Trialtrove (informa.com)
2 Citeline Trials | Citeline Trialtrove (informa.com)
3 Australian Government/Taxation Office.
4 Research and development tax incentive | Australian Taxation Office (ato.gov.au)
5 Australian Government, Department of Health and Aged Care.
6 Citeline Trials | Citeline Trialtrove (informa.com)
7 Role of Clinical Trial Participation in Cancer Research: Barriers, Evidence, Strategies, and Strategies.
8 Clinical Trial Refer
9 Opyl
10 Medicines Australia

About the Authors

Natasha Steyn

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Natasha has over 20 years' experience in the pharmaceutical and CRO field, covering roles from CRA, project leadership, and line management. Her regional and country leadership has expanded over Africa, Australia, New Zealand, India, and Southeast APAC. She is experienced in crafting a strategy in a highly complex project environment to meet bottom-line targets, including training and retaining resources to support the vision and achieve project goals.

Stella Davis

Senior Manager, Regional Feasibility Network, Parexel

As regional network manager for the APAC region, Stella plays a key role in delivery of Parexel trials, focusing on site selection – the cornerstone of more predictable recruitment. She has extensive experience in building working relationships with institutions, investigators, and research teams for better data organization that improves efficiency, knowledge sharing, and ultimately brings life-changing treatments to patients. With over 15 years of experience in clinical research at Parexel, Stella has held various roles including clinical research associate (CRA), clinical operations leader, project leader, and CRA line management. Stella holds a BS in Medical Science from Macquarie University in Sydney.