

## **Mid-level professional in radiology: Mapping of nuclear medicine facilities in the state of Rio de Janeiro to analyze the feasibility of technical specialization courses in the region**

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### **ABSTRACT**

Nuclear Medicine uses radioactive substances for diagnosis and treatment. These substances are called radiopharmaceuticals. These are administered orally, intravenously or by inhalation to distribute them to the organs according to their characteristics. In Brazil, CNEN is responsible for licensing and supervising nuclear medicine services, ensuring safety and control. The aim of the study was to map the authorized NM facilities in the state of Rio de Janeiro, with a view to supporting studies for technical specialization courses in the area. The results revealed that the Southeast concentrates the majority of facilities, with 249, followed by 74 in the South, 69 in the Northeast, 42 in the Midwest and 19 in the North.

**Keywords:** Nuclear Medicine, Radiopharmaceuticals, CNEN, Technical specialization.

### **INTRODUCTION**

Nuclear Medicine (NM) is a branch of radiology that uses radioactive substances (radionuclides) for diagnostic imaging and treatment. Radioactive sources are distributed to organs according to their characteristics and composition with another drug, becoming a radiopharmaceutical. Its administration can be oral, intravenous or inhaled (SBMN, 2024).

According to Resolution No. 12 of the National Council of Radiology Technicians (CONTER) (2005), some of the duties of the Radiology Technician in the NM sector are: operating the device, conducting and guiding patients, documenting exams, handling radioactive waste and applying radiological protection. However, for qualification before the Council, a technical specialization course in Nuclear Medicine (or a higher education course in Radiology Technology) is required.

The National Nuclear Energy Commission (CNEN) is responsible for licensing and inspecting all NM services, that is, no facility can operate without its authorization and control (CNEN, 2024).

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## OBJECTIVE

The objective of the present study was to map the distribution of Nuclear Medicine facilities authorized by CNEN within the state of Rio de Janeiro, in order to promote data that support feasibility studies of technical specialization courses at the secondary level in the segment.

## METHODOLOGY

### FIRST STAGE

A survey of all facilities authorized by the CNEN in the national territory was carried out through the CNEN website, as shown in figure 1. Only NM facilities made available on the site until mid-June 2024 were introduced in the search.

Figure 1: CNEN website page with authorized facilities in Brazil.

Matrícula	Instituição	Cidade	UF	Autorização	Ofício
16564	3D DIAGNOSE LTDA	RIO DE JANEIRO	RJ	10/10/2025	8040/2023
15475	A+ MEDICINA DIAGNÓSTICA	SÃO PAULO	SP	16/03/2025	5541/2024
14924	APEC - HOSPITAL SANTA CRUZ	SANTA CRUZ DO SUL	RS	03/02/2025	7788/2023
14169	ARANUCLEAR - MEDICINA NUCLEAR	ARARAQUARA	SP	15/01/2025	5101/2024
15798	ARARAS MEDICINA DIAGNÓSTICA POR IMAGEM LTDA	ARARAS	SP	21/06/2025	5282/2024
11567	ASSOC. DE COMB. CÂNCER DO BRASIL CENTRAL - HOSR. HELIO ANGIOTTI	UBERABA	MG	09/02/2027	5167/2024
14513	ASSOCIAÇÃO AMERICANENSE DE SAÚDE	AMERICANA	SP	30/11/2025	6207/2023
17269	ASSOCIAÇÃO BENEFICENTE HOSPITAL UNIVERSITÁRIO	MARILIA	SP	21/06/2024	8187/2023
11625	ASSOCIAÇÃO BENEFICENTE SÍRIA	SÃO PAULO	SP	10/06/2025	6240/2024
16561	ASSOCIAÇÃO BENEFICENTE SÍRIA	SÃO PAULO	SP	13/05/2025	6173/2022
15523	ASSOCIAÇÃO BENEFICENTE SÍRIA - HOSPITAL DO CORAÇÃO - UCJ	SÃO PAULO	SP	29/05/2025	6175/2024
17026	ASSOCIAÇÃO CONGREGAÇÃO DE SANTA CATARINA - CASA DE SAÚDE SÃO JOSÉ	RIO DE JANEIRO	RJ	01/03/2025	7170/2023
16534	ASSOCIAÇÃO CONGREGAÇÃO DE SANTA CATARINA - HOSPITAL NOSSA SENHORA DA CONCEIÇÃO	TUBARAO	SC	11/04/2026	6093/2023
13909	ASSOCIAÇÃO DE CARIDADE SANTA CASA DO RIO GRANDE	RIO GRANDE	RS	08/04/2025	6426/2023
14927	ASSOCIAÇÃO EDUCADORA SÃO CARLOS - HOSPITAL MÃE DE DEUS	PORTO ALEGRE	RS	24/04/2026	7723/2023
15430	ASSOCIAÇÃO HOSPITAL DE CARIDADE DE IJUI	IJUI	RS	25/06/2025	7950/2023
17448	ASSOCIAÇÃO HOSPITALAR CARIDADE SANTA ROSA	SANTA ROSA	RS	10/05/2027	6238/2024
14285	ASSOCIAÇÃO HOSPITALAR MOINHOS DE VENTO	PORTO ALEGRE	RS	12/06/2025	6271/2024

Fonte: CNEN, 2024.

### SECOND STAGE

An electronic spreadsheet was prepared with the following information: institution, city and state, as shown in figure 2.

Figure 2: Illustration of the spreadsheet prepared with all the facilities authorized by Cnen at the national level.

Instituição	Cidade	Estado
3D DIAGNOSE LTDA	RIO DE JANEIRO	RJ
A+ MEDICINA DIAGNÓSTICA	SAO PAULO	SP
APESC - HOSPITAL SANTA CRUZ	SANTA CRUZ DO SUL	RS
ARANUCLEAR - MEDICINA NUCLEAR	ARARAQUARA	SP
ARARAS MEDICINA DIAGNÓSTICA POR IMAGEM LTDA	ARARAS	SP
ASSOC. DE COMB. CANCER DO BRASIL CENTRAL - HOSP. HELIO ANGIOTTI	UBERABA	MG
ASSOCIAÇÃO AMERICANENSE DE SAÚDE	AMERICANA	SP
ASSOCIAÇÃO BENEFICENTE HOSPITAL UNIVERSITÁRIO	MARILIA	SP
ASSOCIAÇÃO BENEFICENTE SÍRIA	SAO PAULO	SP
ASSOCIAÇÃO BENEFICENTE SÍRIA	SAO PAULO	SP
ASSOCIAÇÃO BENEFICENTE SÍRIA - HOSPITAL DO CORAÇÃO - UCJ	SAO PAULO	SP
ASSOCIAÇÃO CONGREGAÇÃO DE SANTA CATARINA - CASA DE SAÚDE SÃO JOSÉ	RIO DE JANEIRO	RJ
ASSOCIAÇÃO CONGREGAÇÃO DE SANTA CATARINA - HOSPITAL NOSSA SENHORA DA CONCEIÇÃO	TUBARAO	SC
ASSOCIAÇÃO DE CARIDADE SANTA CASA DO RIO GRANDE	RIO GRANDE	RS
ASSOCIAÇÃO EDUCADORA SÃO CARLOS - HOSPITAL MÃE DE DEUS	PORTO ALEGRE	RS
ASSOCIAÇÃO HOSPITAL DE CARIDADE DE IJUÍ	IJUI	RS
ASSOCIAÇÃO HOSPITALAR CARIDADE SANTA ROSA	SANTA ROSA	RS
ASSOCIAÇÃO HOSPITALAR MOINHOS DE VENTO	PORTO ALEGRE	RS
ASSOCIAÇÃO MARIO PENNA	BELO HORIZONTE	MG

Source: Author's collection, 2024.

## RESULTS

The results of this research showed that there are 453 NM facilities distributed throughout Brazil. Subsequently, the distribution was carried out by regions: 249 in the Southeast, 74 in the South, 69 in the Northeast, 42 in the Midwest and 19 in the North, as shown in figure 3.

Figure 3: Distributions of NM facilities by Brazilian regions.

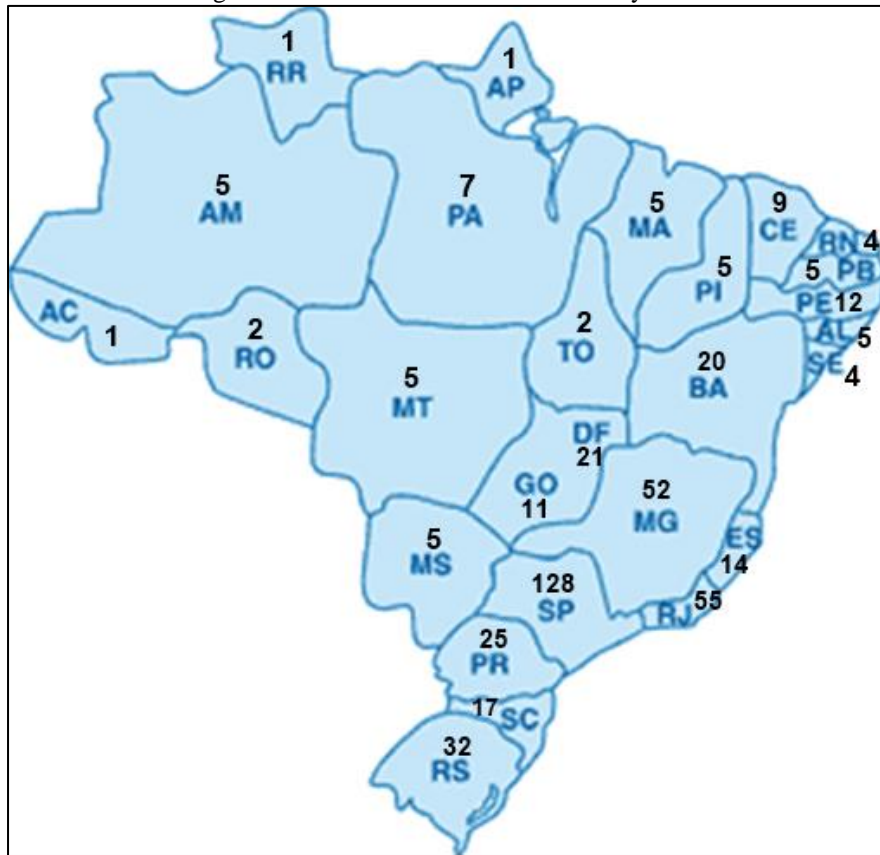


Source: Author's collection, 2024.

Consequently, the facilities were distributed by state, with São Paulo with 128, Rio de Janeiro with 55, Minas Gerais with 52, Rio Grande do Sul with 32, Paraná with 25, Federal District with 21, Bahia

with 20, Santa Catarina with 17, Espírito Santo with 14, Goiás with 11, Pernambuco with 12, Ceará with 9, Pará with 7, Mato Grosso, Mato Grosso do Sul, Alagoas, Piauí, Amazonas, Maranhão and Paraíba with 5, Rio Grande do Norte and Sergipe with 4, Rondônia and Tocantins with 2, Amapá, Acre and Roraima with 1, as shown in figure 4.

Figure 4: Distributions of NM facilities by state.



Source: Author's collection, 2024.

As shown in Table 1, within the state of Rio de Janeiro, the objective of this study, 38 facilities were found in the city of Rio de Janeiro, 3 in Niterói, 2 in Petrópolis, Macaé and Volta Redonda and 1 in Campos dos Goytacazes, Nova Iguaçu, Duque de Caxias, Itaperuna, Cabo Frio, Nova Friburgo, São Gonçalo and Barra Mansa.

Table 1: Distributions of NM facilities in the municipalities of the state of Rio de Janeiro.

Municipalities	Quant.
Rio de Janeiro	38
Niterói	3
Petrópolis	2
Macaé	2
Volta Redonda	2
Campos dos Goytacazes	1
Nova Iguaçu	1
Duque de Caxias	1



Itaperuna	1
Cabo Frio	1
Nova Friburgo	1
São Gonçalo	1
Barra Mansa	1

## FINAL CONSIDERATIONS

Through the results, it was possible to locate 453 facilities authorized by CNEN in the national territory. According to the installations divided by regions, the Southeast was **with 55%, the South with 16%, the Northeast with 15%, the Midwest with 9% and the North with 4%.**

Of the 12% of installations authorized by CNEN in the municipalities of the state of Rio de Janeiro, these are concentrated in: **Rio de Janeiro, Niterói, Petrópolis, Macaé, Volta Redonda, Campos dos Goytacazes, Nova Iguaçu, Duque de Caxias, Itaperuna, Cabo Frio, Nova Friburgo, São Gonçalo and Barra Mansa.**

With such data, it is expected that educational institutions will consider and study the feasibility of offering mid-level technical specialization courses in nuclear medicine, aimed at radiology technicians. For further studies that complement this one, it is suggested to research the institutions already authorized by the State Department of Education (SEE) to offer the course.



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