



INTERNSHIP REPORT

24/09/2018 au 02 /11/2018

AU CENTREHOSPITALIER UNIVERSITAIRE DE POITIERS

Pole Imagerie
d'IRM

Médicale/Service



AOUE G. KORA

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ACKNOWLEDGEMENTS

In France

First of all, I would like to express my deep gratitude to **Mr Fabien VOIX**, Senior Health Executive, Head of the Medical Imaging Division, President of AFPPE and Tutor of my internship, who warmly welcomed me to his department and trusted me during these 5 weeks. I thank him for his precious advice and kindness towards me, as well as for having given me the opportunity to participate in the Journées françaises de radiologie, a relaxing day at the Futuroscope in Poitiers, the Aquarium de la Rochelle and many other activities that have enriched this internship.

I would like to thank the entire team of medical imaging manipulators in the MRI department for their pedagogy, their patience, their precise explanations of the manipulations that allowed me to quickly feel comfortable (if I may put it that way), and to learn as much as possible about this fabulous machine that is MRI. Without them this internship would have been in vain.

Thank you to the heads of external relations of AFPPE, in particular **Philippe GERSON, Dominique ZERROUG, Jocelyne LEGOAZIGO** for their proximity and their constant trust in me, without whom this internship would never have taken place. I do not forget the entire AFPPE team for their availability and understanding by accepting me among them.

In England:

My sincere thanks go to **Miss Susan MARCHANT** with whom I have had a long exchange and who brilliantly managed the awarding of the **World Radiography Educational Trust Foundation** scholarship.

My gratitude and best regards to the Chairman of the WRETF, **Mrs Cynthia COWLING** and the entire team of trustees who became involved at a time when the internship project seemed compromised.

Finally In Burkina Faso:

My thanks go first of all to Professor **Rabiou CISSE**, my head of

department, for having granted me his discharge for this internship, **Professor Jean LANKOANDE**, head of the Yentema Polyclinic, who has always encouraged me.

N.B.

My full report to the WRETF Trustees contains my thanks to a number of other people who also helped me.

INTRODUCTION

This internship was mainly motivated by my desire to strengthen my MRI capabilities because our hospital will acquire this technology in the future.

This adventure was made possible thanks to the WRETF, **an NGO** under English law independent of ISRRT, which awarded me a grant in May 2018.

Initially planned to take place at the **Hôtel DIEU hospital in Paris**, this internship was relocated to Poitiers because of the ideal setting offered to the Centre Hospitalier Universitaire de POITIERS with four MRIs, three of which were SIEMENS, which happens to be the brand on which I wanted to learn. It was also an opportunity to discover the city of POITIERS, its culture and history. It was mainly held at the MRI department of the CHU de POITIERS from September 24 to October 26, 2018, during which time I also participated in the Journées Françaises de Radiologie where several themes on MRI were also developed.

Built around well-defined objectives, this internship should allow me to acquire MRI realisation skills and to share them with my department if I acquire our MRI.

The objectives defined were as follows:

I- The General Objectives:

- * Strengthening my capacity to manage patients at CHU-Yalgado Ouedraogo.
- * At the end of this internship I also planned to apply for a temporary teaching position at the National School of Public Health (ENSP) in Ouagadougou, manipulators section.

II-Specific Objectives :

In I.R.M. (Duration: about 4 weeks)

1-The different materials:

- to learn about all of the equipment and to know how to locate them in the examination and preparation rooms: comfort and restraint equipment (cushions, wedges, translation mattresses...)
- Know the different antennas necessary for the successful completion of the exams.
- Know the materials and products necessary in the event of an allergic shock (emergency anaphylactic shock management trolley+++)

2-Initiation to MRI

- Acquire the theoretical knowledge necessary for the practice of magnetic resonance imaging (Understanding the principles and physical foundations of MRI, Technology, Image reconstruction, Artifacts management, Image quality...)
- Know the sequences and main applications in MRI (Main routine acquisition techniques, Basic acquisition sequences...)
- Acquire knowledge in anatomo-pathology and on the main indications and contraindications for MRI
- Know the contrast products used in MRI (contrast modifiers.....)
- Identify the role of the manipulator++++
- Drive any routine MRI examination without assistance.

3-Perfecting with MRI

- Acquire knowledge of new sequences: rapid imaging, spectroscopy, flow imaging, applications in cardiology and vascular imaging (Acquire procedural knowledge in Angio-MRI, Cardio MRI...)
- Acquire theoretical and procedural knowledge about the sequences used in routine and new sequences in particular:
 - Image reconstructions, Routine acquisition sequences: spin echo, gradient echo, planar echo, inversion recovery

Be able to conduct any MRI examination without assistance

B-TDM (SCANNER, duration one week)

1-TDM development

- Understanding new reconstruction applications
- To know the main neurological, ENT and vascular pathologies studied in CT.
- Be able to apply the CT examination protocols according to the indication and pathology NEURO, ENT and Vascular (Angiography) sought, Recognize the main anatomical structures NEURO, ENT and Vascular useful on CT cuts

TRAINING FRAMEWORK

My internship took place from September 24 to October 26, 2018 in the Imaging Department of the CHU Poitiers. The centre is open to medical school students (external and internal), manipulative students and health executive students.

The University Hospital Centre of Poitiers (or CHU de Poitiers) is a university hospital centre located on the site of La Milétrie, route de Limoges, south-east of the city of Poitiers in France. The University Hospital Centre of Poitiers has more than 1,900 beds and places, spread over three sites: the Métrie Hospital, the Lusignan site and the Montmorillon site. More than 8,000 employees work in this hospital.

The Poitiers University Hospital provides a local mission for the 142,000 inhabitants of the Poitiers urban community. This mission consists in offering a complete range of care: short stay, follow-up care, rehabilitation and long-term care.

The University Hospital Centre of Poitiers is a regional centre for the 450,000 inhabitants of Vienne and the 1,800,000 inhabitants of Poitou-Charentes. This recourse applies in particular to cardiology, oncology, geriatrics, neurosurgery, pediatrics, biology and imaging and many other specialties.

The University Hospital of Poitiers offers a multidimensional training framework, as can be seen from the following:

1-Medical Faculty (1)

2-Pharmacy Faculty (1)

3- eight (8) schools and institutes and 1 preparatory cycle

-Preparatory cycle for medical and paramedical competitions

-Emergency care teaching centre (CESU 86)

- School of Health Care Assistants
- School of anaesthetists nurses
- Institute for the Training of Ambulance Attendants (IFA)
- Midwifery school
- Institute for the Training of Health Executives (IFCS)
- Institute for the training of electro-radiology manipulators
- Medical (IFMEM)
- Training Institute for Physiotherapy Massage Training (IFMK)
- Institute for Nursing Education (IFSI)

-The University Hospital of Poitiers has an Imaging Centre with the latest generation equipment from the world's leading manufacturers. The functional and therapeutic diagnostic imaging division includes radiology, nuclear medicine, radiotherapy, electro-radiology, ultrasound and MRI services. It performs 85% of diagnostic imaging, 5% of therapeutic imaging and 10% of medical research. The Imaging Centre has more than 100 manipulators and more than 20 doctors. Towards the end of 2017 a new 3 Tesla IRM was commissioned. This pole ensures clinical and fundamental research work and for this purpose an MRI 7 tesla will be installed in 2019 under the direction of **Prof. Remy GUILLEVIN**. The University Hospital remains one of the best equipped hospitals in France. The Imaging Division includes

- Scanner: 4 including one of 360 bars.
- MRI: 4 including three Siemens branded
- Scintillating cameras: 4
- PET scan in nuclear medicine: 2
- Digital radiology: 6
- Vascular radiology: 1
- EOS radiography room.
- Several echo rooms
- Radiotherapy.



PROGRESS (LEARNING AND ACTIVITIES DURING THE INTERNSHIP)

To develop our knowledge and link the theoretical notions we have learned to practice, an internship in a hospital department is generally essential. As far as my case is concerned, the situation is absolutely unprecedented in that I immediately discovered magnetic resonance imaging in its theoretical and practical aspects during this internship. It took a lot of patience and calm for my fellow trainers to try to teach me the maximum in such a short time. This MRI internship lasted four (4) weeks. To this end we presented ourselves on Monday 24/09/2018 at the office of the senior manager of the Imaging **cluster Mr Fabien VOIX** who immediately took us to the MRI department where I was introduced to all the staff present. Without delay I was provided with a gown and adapted shoes and forward in the big bath. My internship time was distributed over the three (3) Siemens MRIs at the University Hospital as follows:

From Monday, September 24 to Friday, September 28: Assignment to the **MAGNETOM VERIO 3T Siemens** where the training began with the assimilation of safety rules; MAJOR priority in MRI.



I was present in the MRI department five (5) days a week throughout the entire stay. The first week thus made it possible to fully achieve objective N°1, in particular the knowledge of MRI safety, the discovery of the equipment and environment of the MRI room (antennas, the care table, hygiene, patient handling equipment, patient installation according to examinations, the organisation of patient reception, the operation of the automatic injector, the most important before the examination, the interrogation of the patient and finally the discovery of the device and its operation. Not having any prerequisites on this equipment, the colleagues recommended the website www.imaos.fr to accelerate my theoretical training. Other colleagues have volunteered to offer me documentation and courses. My integration was not difficult because of the open-mindedness of the colleagues and especially their willingness to help me progress in the immersion of this new imaging technology. During my internship I also participated in the MRI sessions in the emergency rooms, which are generally held after the departure of the day's shift, which is replaced by two manipulators who work from 4pm to 8pm and who remain on call all night at home. All MRI exams are scheduled every 30 minutes and at least 15 MRI exams are performed daily



Sur la console de l'IRM Siemens MAGNETOM VERIO

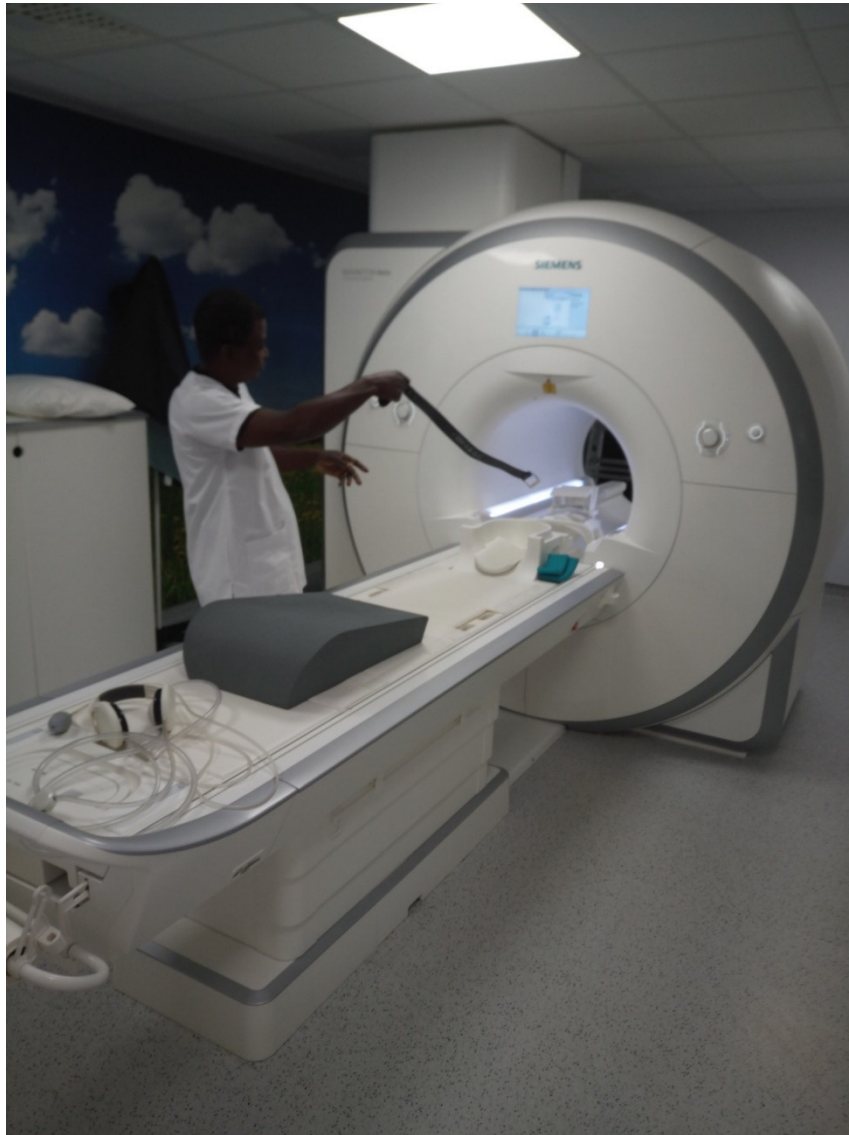
The weekend was used to socialise with French colleagues in the city of La Rochelle where the President of AFPPE did me the honour of associating myself with one of their activities. It was the opportunity to discover this beautiful tourist city and the next day to discover its Aquarium internationally known under the aegis of AFPPE who graciously offered me the aquarium ticket and the return ticket by TGV on Sunday.



Image de l'aquarium de la Rochelle en Haut et en bas avec les collègues de cette ville.



The second, third and fourth weeks took place from Monday, October 1 to Friday, October 20 (interrupted by my participation in the **JFR 2018 in PARIS from October 10 to 15, 2018**) on another **Siemens AERA 1.5 Tesla MRI** machine at the Regional Cancer Centre (GIE-PRC), an equipment shared with the private sector in the form of an EIG (economic interest group). The teams (manipulators and doctors) of the public sector of the CHU Poitiers and the private sector take turns with a variable frequency of 3 days against 2 in the week and vice versa. On this machine, which most probably comes close to what we could have in our hospital, I spent a large part of my internship time there. The internship consisted of consolidating the achievements of the first week: interviewing the patient (very important in MRI), installing the patient, setting up antennas adapted to the examination, setting up secure infusions for gadolinium injection, handling the automatic injector, participating in the hygiene activities of the room, then taking control of the console for performing routine MRI examinations. These three weeks took place alternately with the Regional Cardiovascular Centre (CCV) where a **SIEMENS 3Tesla MRI "MAGNETOM SKYRA"** has been installed since 2017. 3T MRI allows high field magnetic resonance images to be taken during a neurosurgical procedure. The first operation using intraoperative MRI 3 tesla* was performed on June 23, 2017 by the teams of **Dr. Philippe Page**, neurosurgeon, and **Professor Rémy Guillevin**, radiologist. The MRI room is a multimodal room located in continuity with the neurosurgery room. The IRM 3T is used to validate operating procedures. Here it is an operating room dedicated to neurosurgery adjacent to an MRI room and can be placed under a block environment (ISO5 air quality). 60% of MRI is dedicated to neuroradiology research, and the rest is used for intervention and classical diagnostics.



Démonstration de L'effet missile en IRM



Sur la console de l'AERA 1,5T



Avec Alexandra une collègue sur IRM AERA 1,5T



Avec le Professeur Remy Guillevin Chef Adjoint du Pole Imagerie



L'IRM 3T SKYRA du CCV

COURSE, COMPLEMENTARY TRAINING and DISCOVERY OUTPUT

In addition to this internship, I was AFPPE's guest at the JFR 2018 which took place at the Palais des Congres "Porte Maillot" in Paris where I was able to attend the various presentations dedicated to the manipulators. It was from Wednesday, October 10 to Monday, October 15, 2018. That's why, in order not to go all over the place, I chose to focus on all communications on MRI and scanning. This was an invaluable contribution in that these JFR 2018s helped to strengthen my theoretical training in MRI. I was able to follow brilliant communications on MRI safety, cardiac devices on MRI, child care on MRI, etc. This was a plus and I would like to thank AFPPE again for its presence and invaluable support. The fourth week ended with a relaxing outing at the Futuroscope in Poitiers. It is an essential visit for those who come to POITIERS. We also visited **the Abbey of Saint SAVIN** and the medieval castle of **CHAUVIGNY**. These visits, far from being simple tourist relaxation, actually allow you to relax in view of the intensity of the work that is unusual for us.



Aux JFR 2018 à Paris

The fifth and final week took place from Monday, October 22 to Friday, October 26, 2018 and was conducted by the VCC and the scanner service. The objective of this week was to see the vascular applications with a scanner. In addition to the 3T IRM, the VCC is equipped with a broad spectrum scanner designed for the Coro-scanner activity.

Indeed it is a 360 bar scanner from TOSHIBA capable of making a complete acquisition in 1/2 second. This last week went very well with colleagues who, with my scanner prerequisites, did not hesitate to pass my hand on the console. This last week was also very stressful from a health point of view because I suffered from a severe hypertensive crisis that caused me to be hospitalized for a whole afternoon. The involvement of the internship tutor **Mr Fabien VOIX** allowed me to receive the necessary and adequate care.

It is also the final stretch and the moments of separation are approaching with a lot of emotion, joy, sadness, complicit and questioning looks on the follow-up to be given to these moments of short but intense exchanges. Thus, on Friday, October 26 at the break time, a friendly reception was offered in the department for the end of my internship. I left the MRI department on Friday 26 October with great emotion and a knotted throat after greeting all the colleagues present.

I joined my hotel **BARTH'HOTEL**, a friendly three-star hotel located 15 minutes from the hospital on foot. The stay in this hotel was offered by AFPPE. It should be noted that after paying my accommodation expenses the first week after my arrival at the Youth Hostel, I moved here the rest of the internship time.

The Grand departure from Poitiers to Paris was on Saturday 27 October by TGV where I still had the honour of being accompanied by **the President of AFPPE Mr. Fabien VOIX**. The stay in PARIS was a complete relaxation and I was able to visit the EIFFEL tower and visit friends. I was able to recover from fatigue before flying to Ouagadougou on Friday, November 02, 2018.



Avec Guillaume TRAINAUD, Alexandra et Liliane



Avec les mêmes collègues



Avec Fabien VOIX, Philippe, Vincent, Guillaume, Fred, Jonathan, et Tiphaine en arrière-plan



Avec Thiphaine, Camille, Alexandra, Liliane, Philippe en bas comme en haut



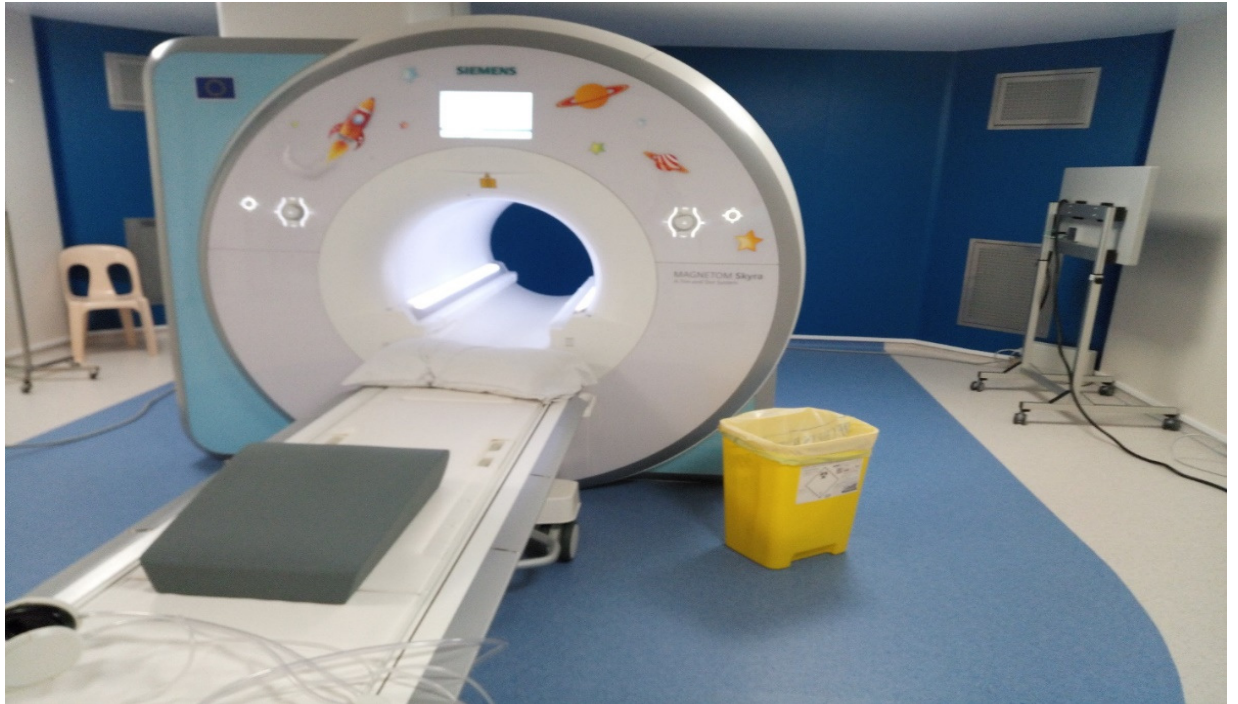


Avec Alexandra et Tiphaine en haut, Vincent, Céline et Christophe en bas



L'IRM Aéra 1.5 T

l'IRM Skyra 3T en bas



*Avec le Pr TASSU chef de service, La directrice du Pole Imagerie, et Fabien VOIX
cadre supérieur du Pole Imagerie*

Entrain de quitter définitivement l'hôpital.



CONCLUSION

I have achieved the main internship objectives based on my initial level. The theoretical objectives could not be achieved during this internship due to the very short time available and also the absence of a planned lecture course. That is not the role of the MRI service. Having come to Poitiers on the basis of very high objectives, I was able to measure that it takes more than a month of training to practice MRI fluently, and that it must also be supported with theoretical courses. However, I was able to have a more in-depth knowledge of MRI imaging during the internship and this will allow me to improve my practices in the Ouagadougou Radiology Department as soon as the technical platform allows. Always with a view to deepening my knowledge, I am giving myself the opportunity to enroll in MRI courses that combine theory and practice in the near future. I will probably come back to the Trust Foundation to solicit further support. I consider this internship, more than convincing as an introduction to MRI. I have acquired enough knowledge to share it with my colleagues in a timely manner.

For the moment, what I will do is to share documentation offered free of charge by my colleagues from Poitiers and **AFPPE**.

One of the greatest merits of this internship is that it has generated a lot of empathy from colleagues at the University Hospital of Poitiers, the senior pole manager, pole officials... etc. Everyone is committed to supporting us in our training projects, either by welcoming new trainees to the University Hospital of Poitiers or by sending fellow trainers to our country in due course. I would like to thank **TRUST FOUNDATION and AFPPE** for having joined forces to support a global citizen in his learning project in a spirit of solidarity and friendship. As **VICTOR HUGO** says so well: "**Fraternity is only a human idea, solidarity is a universal idea**"

Kora G. AOUE

Fabien VOIX

Rabiou CISSE

Manipulateur Stagiaire

Burkina -Faso

Cadre Supérieur de Santé

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