

## Marie Skłodowska Curie (1867-1934) - CONTRIBUTION TO WAR RADIOLOGY DEVELOPMENT

*Rade R. Babić and Gordana Stanković Babić*

Marie Skłodowska Curie was born on November 7, 1867 in Warsaw (Poland). She suffered from leukemia and died on June 4, 1934. She was buried with full honors at Panteon. Marie Skłodowska Curie introduced the term radioactivity into science. During World War I, Marie Skłodowska Curie was working on creating the mobile x-ray room, the so-called "radiologic car". Marie Skłodowska Curie installed the x-ray machine into a car, and showed in practice how to use its dynamo for electric power production necessary for the work of the x-ray machine. She made 20 cars with moving radiology lab and trained 150 people to work on them. She introduced something really new into military medicine - a mobile radiology diagnostics. With the discovery of radioactive elements, a new medical branch - radiotherapy, was developed. *Acta Medica Medianae 2010(1):70-72.*

**Key words:** *Maria Sklodowska Kiri, radiology, x-ray, radiotherapy*

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Centar for Radiology, CC Niš

Contact: Rade R. Babić  
Institut za radiologiju, Klinički centar Niš  
Bulevar Zorana Djindjića br. 48  
18000 Niš, Srbija  
E-mail: gordanasb@nadlanu.com

Marie Skłodowska Curie (Photo 1) was born on November 7, 1867 in Warsaw (Poland) (1-8). In 1891, she went to Paris, enrolled in a degree program at the Sorbonne University, and in 1893 she graduated in physics, and in 1894 in mathematics. After graduating, she worked in the Lippmann's laboratory where she met Pierre Curie. In 1895, she married him. With their experimental work, Marie and Pierre Curie gave big importance to uranium ( ${}_{92}\text{U}^{238}$ ) radiation; they discovered new radioactive elements - polonium ( ${}^{84}\text{Po}_{210}$ ), thorium ( ${}_{90}\text{Th}^{232}$ ) and radium ( ${}^{88}\text{Ra}_{226}$ ), and they introduced in our language the term- radioactivity.

In 1903, Marie Skłodowska Curie defended her doctoral thesis titled: "Research on radioactive substances".

In 1903, a married couple shared the Nobel Prize in Physics along with Henri Becquerel for their work on radioactivity.

On April 11, 1906 Pierre Curie died in a carriage accident. After Pierre's tragic death, Marie Curie continued her scientific research till the end of her life, even though she had to take care of their two daughters, born in 1897 and in 1904.

In 1911, Marie won another Nobel Prize, this time in Chemistry, for the discovery of the radium ( ${}^{88}\text{Ra}_{226}$ ) and polonium ( ${}^{84}\text{Po}_{210}$ ).

Little is known that Marie S. Curie laid the groundwork for radiology during the war times, putting the whole concept into practice.



*Photo 1. Marie Skłodowska Curie was born on November 7, 1867 in Warsaw (Poland). She fell ill with leukemia. She died on June 4, 1934. She was buried with full state honors in Pantheon*



Photo 3. Mobile MR apparatus. The picture presents 5 Tesla MR (Philips Gyroscan T5) – schematic presentation of the trailer, ready for operation, spacious interior of scan room permits easy transfer to patient table and large, convenient working area for maximum operator efficiency and comfort

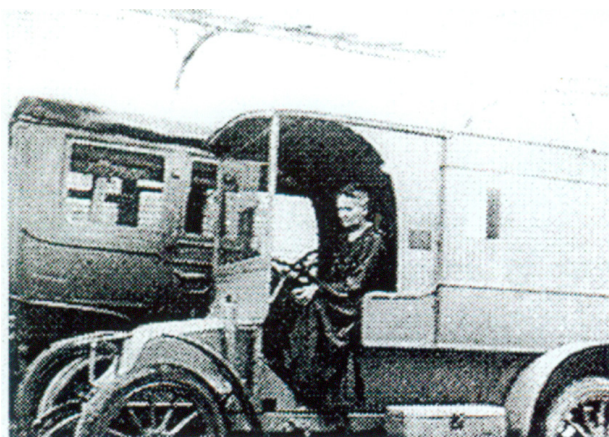


Photo 2. Marie Skłodowska Curie – mobile X-ray from World War I

During the World War I, Marie S. Curie worked on creating the X-ray mobile room (Photo 2). The Alliance of French women provided the funds for creating this X-ray mobile room. That is how the first "mobile van" became in 1914, and named "little Curies". She has shown to the world how to install the X-ray machine into an automobile and how to use the dynamo to generate electricity necessary for X-ray machines.

Lots of rich Frenchwomen donated cars for the defense of France and salvation of French soldiers at request of Marie Curie. In the same year, she equipped 20 vans with mobile radiological laboratories and trained 150 individuals. She kept one vehicle for herself, so that she could make it to the war zone and train medical staff to operate the X-ray equipment, and take x-ray images of wounded soldiers.

With this invention, Marie S. Curie enabled making diagnosis, by the radiographic findings, of injuries, bones fracture and location of shell fragments in the bodies. Therefore, she

introduced something completely new into the military medicine - the mobile war radiology diagnostics.

Nowadays, lots of armies in the world have modern radiological service. For example, the army of the former USSR had trucks with installed roentgen apparatus and photo-laboratory, which were made in EI in Niš. Today, known manufacturers of roentgen machines produce and build in trucks x-ray machines, CT, MR (Photo 3) and echo apparatus making them mobile. Aren't the buses with a fluorography apparatus used for the examination of habitants in a prevention of lung tuberculosis the same thing that Marie imagined and created?

After the end of the World War I, Marie continued with her activities. She fell ill with leukemia, and on July 4, 1934 Marie died. She was buried in the Pantheon in Paris with full state honors.

So, Marie's idea about the "radiologic van" had lived and still lasts. A new chapter in the military medicine was created - mobile war radiological diagnostic.

In the honor of the Curie's family, the unit of radioactivity 1 Curie (1 Ci) was introduced, which defined the intensity of radioactivity of radioactive material, and defined the activity of 1 gram of the radium decays  $3.7 \times 10^{10}$  nucleus per second. Today, the unit of radioactivity is 1 Bq (Becquerel). Becquerel is the SI derived unit. 1 Bq is defined as the activity of a quantity of radioactive material in which one nucleus decays per second ( $1 \text{ Bq} = 1/1 \text{ s}$ ). The ratio between the old and the new unit of the activity of radioactive material is:

$$1 \text{ Ci} = 3,7 \times 10^{10} \text{ Bq}$$

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## MARIJA SKLODOVSKA KIRI (1867-1934) - DOPRINOS RAZVOJU RATNE RADIOLOGIJE

*Rade R. Babić i Gordana Stanković Babić*

Marija Skłodovska Kiri rođena je 7. novembra 1867. godine u Varšavi (Poljska). U starosti se razbolela od perniciozne anemije. Život joj se ugasio 4. juna 1934. godine. Sahranjena je uz sve državne počasti u Panteonu. Marija Skłodovska Kiri je dala novu reč - radioaktivnost. Za vreme Prvog svetskog rata, Marija Skłodovska Kiri radila je na stvaranju mobilne sale sa X-zracima, tj. stvarala je pokretna "radiološka kola". Marija Skłodovska Kiri je pokazala i u praksi primenila kako da se u automobil instalira rendgen aparat i kako da se dinamo, koji pokreće automobil, iskoristi za proizvodnju električne struje za rad rendgen aparata. Na tom poslu Marija Skłodovska Kiri je opremila 20 kola sa pokretnom radiološkom laboratorijom i obučila 150 lica da na njima radi. Marija Skłodovska Kiri uvela je u vojnu medicinu nešto sasvim novo – mobilnu radiološku dijagnostiku, tj. ratnu radiologiju, a sa otkrivanjem radioaktivnih elemenata došlo je do razvoja nove medicinske discipline – radioterapije. *Acta Medica Medianae 2010;49(1):70-72.*

**Ključne reči:** *Marija Skłodovska Kiri, radiologija, X-zraci, radioterapija*