

## Initiative summary

### Mobile Medical Electronic Prescription (PEM Mobile)

PEM Mobile has a successful approach to the following topics:

- Execution
  - **Authentication – authorization mechanisms**
  - **Integration with EHR**

#### Scope of the mHealth practice

The Mobile Medical Electronic Prescription (PEM Mobile) is a mobile application developed by the Shared Services of the Ministry of Health (SPMS) used by physicians for drug prescription. It was developed within the national strategy to fully dematerialized prescriptions, under the Decree Order nº 284-A / 2016<sup>1</sup>, Article nº 8A.

The PEM Mobile allows to execute prescription validation and registration in an online mode, ensuring the issue of prescription in a paperless format.

The app is free of charge and is available for IOS and Android systems, by downloading in the respective online store.

In Portugal, the electronic prescription (eP) is the principal method used for prescribing, with few exceptions for manual prescription (e.g, in event of computer system failure, unavailability of the prescription through mobile devices, or in situations where the citizen is unable to receive a dematerialized prescription or to materialize it)<sup>2</sup>.

#### Topic: Authentication / authorization mechanisms

To use the PEM Mobile, physicians / dentists need to have an active Digital Mobile Key and digital signature by Digital Mobile key. In addition, they need to request a registration in the application. The physician / dentist is a legally authorized healthcare provider registered in the respective Portuguese Professional Order.

The Digital Mobile Key is a service provided by the Agency for Administrative Modernization (AMA), and it is considered a high-level secure two-factor method for authentication. Physicians can authenticate themselves in the PEM mobile, by

- Mobile number
- Digital Mobile Key PIN (personal identification number) code
- Single, temporary 6-digit numeric security code sent by SPMS to the mobile phone number or by email.

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<sup>1</sup> Decree Order nº 284-A / 2016 published in Diário da República nº 212/2016, 1st Supplement, Series I of 2016-11-04).

<sup>2</sup> Decree Order nº 390/2019 published in Diário da República nº 208/2019, Series I of 2019-10-29.

After downloading the application, the first step is the activation of PEM Mobile. This activation aims to associate the mobile device with the prescribing physician, for the purposes of digital identification (eID).

To perform this parameterization, the Digital Mobile Key (CMD) must be used, and the user must confirm the Tax Identification Number (TIN) plus Mobile Number associated with the CMD. Later, the physician will be asked for the CMD PIN. If the three data are correct, a text message is automatically sent to the mobile phone number provided (and validated at the CMD) with a code (TOTP) that must be entered in the PEM Mobile for activation. If the data entered is not correct, the application returns a message to the user informing him / her that he /she must verify the data or proceed with registration by CMD, if he / she has not already done so.

The conclusion of the PEM Mobile activation is done with the user choosing a PIN number that is later encrypted. To avoid the CMD authentication process whenever the prescriber accesses the PEM Mobile prescription application, the prescriber defines a personal PIN that is saved in the last validation phase. The PIN entered by the prescriber is associated with a CMD Token code which is renewed every 15 days.

To improve the usability of the PEM Mobile, the PIN can be associated with the fingerprint reading mechanism, if available on the device.

The patient can receive the electronic prescription (eP) in three different forms:

#### Topic: integration with EHR

The PEM app can be invoked from a certified and secure patients electronic health record software (Electronic Health Record – Professional Area, RSE-AP). When invoked by the local software, patient data (name, date of birth and national health number) is sent to the system and is verified to allow for a prescription through PEM service.

When authenticated to the prescription module, it is possible to obtain some patient health records information related to medication prescription (e.g., patient allergies, previously prescribed medication and chronic medication). During the medication selection, PEM checks for allergies to the active substance and sets warnings in case of such allergy is detected. This information is validated through the Electronic Health record (HER).

There is a central national registry for

- National Patient Registry (for patient identification, and benefits)
- National physicians / dentists registry (for prescriber identification and authorization, integrated with national professional boards)
- Patient Summary (for allergies and adverse reactions, chronic medication, diseases)
- Patient Portal (to verify consent)
- National Drug Information Database (for drug information, including prices)

In this central system, there is a layer of services for e-Prescription and e-Dispensation.<sup>3</sup>

After the prescription is recorded on the central database, the patient receives an e-Prescription code, which in addition to his / her citizen ID card or treatment guide allows for the patient to go

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<sup>3</sup> Please see figure 1 in article *Procedia technology*, 2013, 9, 1313.

to a pharmacy to retrieve his / her medication. The pharmacy systems interact with the central system, as well.

Through the central record, physician can have access to the prescription information prescribed on both National Health System (NHS) and non-NHS institutions.

At the end, there is also an invoicing process related to the reimbursement, for the National Health System (reimbursement office), which in turn also interacts with the national central system to compare the information of pharmacy with the recorded information of e-prescription.

The patient can receive the information regarding the eP through, text message, email (with treatment guide) or paper (treatment guide).

In addition, the citizen can check the information regarding the medication in the citizen portal (Área do Cidadão) or in the app mySNS Carteira (MyNHS Wallet).

## References

<https://pem.spms.min-saude.pt/sobre/> (English version)

<https://www.sciencedirect.com/science/article/pii/S2212017313003010> (Article)