

# ALCMEONE project in South Italian area: Digital health for supporting integrated and remote health care in pandemic scenarios

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## Commentary

The spreading of the Electronic Health Record has substantially changed the vision of the European Health Systems, moving from vertical approaches to solutions able to organize and manage entire health care processes based on the integration of care settings [1]. These solutions should be arranged so that even the citizen/patient can be more involved in his own care, leaving the role of passive actor. Under this respect, several chronic care models have been successfully adopted, that defines specific care pathways for chronic diseases and fosters the concepts of continuity of care.

Within this framework, the industrial research and development project ALCMEONE (Italian Ministry of Economic Development funds, 2018-2021) aims at providing an innovative organizational and management model and an advanced technological platform of services for supporting the integrated clinical management of headache patients [2,3]. The main expected results of the project concern the integration of patient-centered healthcare pathways, fully aided by ICT platform of services, by involving and supporting the same patient in the self-management of the disease, and allowing the primary care level to effectively and efficiently manage most of the cases.

ALCMEONE has the ability to facilitate and support the interoperable integration of the different clinical settings into an integrated headache care network, led by a specialized third level hub. In this respect, the recently approved Calabrian Headache Regional Network (Calabria Regional Administration – Italy, Commissioner for Regional Health Care System, Calabrian Headache and Migraine Regional Integrated Care Network and Clinical Workflows – Administrative order N°9, January 14, 2016) following the most recent guidelines and the best clinical practice, and beneficially exploiting the ALCMEONE platform services, optimize the available resources allocating them in order to combine the best possible service effectiveness and cost effectiveness, thereby increasing the efficiency and effectiveness of the regional healthcare services [2]. In fact, in Italy, particularly affected there is a real difficulty of the national health system to respond to the needs of Covid-19 patients and avoid an induced worsening of SARS-CoV-2 symptoms [4].

The valuable impact of ALCMEONE approaches can be further appreciated in this time of COVID-19 pandemic and, more

generally, within any infectious pandemic scenarios. In fact, the current emergency situation represents a challenging test for *e-health* innovative solutions, like ALCMEONE platform and management model, to prove how suitable and effective they are in unpredictable and urgent circumstances.

It is worthy to remark that in infectious pandemic scenarios:

- ALCMEONE services can support to mitigate the risk of infection of healthcare professionals by minimizing the amount of face-to-face interactions; moreover, also clinicians with mild symptoms can still work remotely with patients.
- ALCMEONE services can improve the management of headache patients in relevant cases of (i) self-isolated/home-isolated patients (self and distance monitoring), (ii) patients with mild cases (distance monitoring and treatment), (iii) patients after discharge (follow-ups).
- Most notable, ALCMEONE services can effectively aided the management of the most serious chronic headache patients at the specialized third level hub, mainly supporting the therapy planning based on the novel monoclonal antibodies (mAbs), targeting the CGRP-receptor or CGRP-ligand, or any other preventive care treatments (e.g. topiramato, amitriptilina, etc.).

Patient empowerment is a process designed to facilitate self-directed behavior change. Individuals perform autonomous decision making in order to self-manage the condition, gain control over health, and interact in an informed, conscious, active way with the physicians. Patient’s empowerment appears particularly appropriate in chronic diseases, like headache and migraine, that strongly affect several aspects of the patient’s life. The challenge that ALCMEONE is facing concerns how to improve patient empowerment and its wide diffusion in the management of chronic headaches. The ALCMEONE App supports patients in the management of health conditions,

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providing the “headache diary”, services for the control of the therapy compliance, questionnaires for monitoring the lifestyle and detect the current status of the disease. All the collected data and information are made available, with the appropriate access rights and by assuring the relevant privacy policy, to the suitable healthcare operators.

Moreover, effective, and efficient resource utilization represents a strategic objective of every health care system. Day Service represents an innovative and efficient health care model, to deliver, at operational level, diagnostic tests and therapeutic treatments, based on clinical prioritization, that can tackle the hinder of long waiting, minimize the risk of diagnosis uncertainty, and avoid inappropriate hospitalization, or limit patient access to the Emergency Department. The organizational approach of Day Service is based on one-day admission, suitable for tailoring clinical services on patient’s needs. It applies well to clinical domains where multidisciplinary diagnostic tests and therapies are needed. Clinical service delivery is planned in advance, after a baseline visit, and patients are queued and scheduled in function of a priority, based on their severity level. This model is well suited for cephalalgic patients, who do not require hospitalization, but are often prone to inappropriate diagnosis and long waits for clinical service delivery.

The Decision Support System (DSS) is one of the fundamental layer of the ALCMEONE Platform, which will provide a captivating and pro-active informative and decision making dashboard in order to effectively and efficiently support the headache clinical management processes, mainly at the primary and secondary levels. The domain

based deductive knowledge has been elicited from clinical protocols and guidelines, healthcare workflows and formalized into ontologies augmented with basis of rules. The system implements a questionnaire supporting physicians, with the aim of providing an exhaustive description of all possible diagnoses defined by the international classification of headache disorders (ICHD). The questionnaire dynamically adapts to the patient whenever he/she provides new information concerning its symptomatology. The strategy underlying the choice of the next question has been designed to guarantee the efficiency of the diagnostic process, minimizing the total number of questions to be asked to the patient.

The deployment of this system could significantly increase the efficiency of the different one’s processes, possibly reducing not only the costs of healthcare but also a spread of COVID 19.

### References

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