



SPECIAL ARTICLE

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Ifema hospital model. Implementation and start-up of the Pharmacy Department**Modelo hospital de IFEMA. Implantación y puesta en marcha de su Servicio de Farmacia**Ainhoa Aranguren-Oyarzábal, María Segura-Bedmar,
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Farm Hosp. 2020;44(Supl 1):57-60.**Abstract**

On the 20th of March 2020, triggered by the public health emergency declared, the Health Authorities in Madrid reported a legal instruction (Orden 371/2020) indicating the organization of a provisional hospital to admit patients with COVID-19 at the Trade Fair Institution (IFEMA).

Several pharmacists working in the Pharmacy and Medical Devices Department of the Madrid Regional Health Service were called to manage the Pharmacy Department of the abovementioned hospital. Required permissions to set up a PD were here authorized urgently.

Tackling human and material resources, and computer systems for drug purchase and electronic prescription, were some of the initial issues that hindered the pharmaceutical provision required for patients from the very day one.

Once the purchase was assured, mainly by direct purchase from suppliers, drug dispensing up to 1,250 hospitalized patients (25 nursing units) and 8 ICU patients was taken on. Dispensing was carried out through either drug stocks in the nursing units or individual patient dispensing for certain drugs.

Moreover, safety issues related to prescription were considered, and as the electronic prescription was implemented we attained 100% prescriptions review and validation. The constitution of a multidisciplinary Pharmacy and Therapeutics Committee let agree to a pharmacotherapy guide, pres-

Resumen

El día 20 de marzo de 2020 la Consejería de Sanidad publicó una Orden (371/2020) para la apertura de un centro hospitalario provisional para atender a pacientes COVID-19 en la Institución Ferial de Madrid (IFEMA), por razón de emergencia sanitaria.

Se dispuso un equipo de farmacéuticos de la Subdirección General de Farmacia y Productos Sanitarios para la apertura de un Servicio de Farmacia, que obtuvo la autorización correspondiente por el órgano competente, con carácter de urgencia.

La gestión de recursos humanos, materiales y de herramientas informáticas para la adquisición y prescripción electrónica fueron unas de las primeras dificultades que se solaparon con el primer reto de garantizar la prestación farmacéutica a los pacientes que atendía el hospital desde el mismo día uno.

Asegurada la adquisición, fundamentalmente mediante la compra directa a proveedores, se planteó la dispensación para un máximo de 1.250 pacientes de hospitalización (25 controles de enfermería) y una Unidad de Cuidados Intensivos de 8 pacientes; se establecieron botiquines en las unidades de enfermería y circuitos individualizados de dispensación para determinados medicamentos.

A su vez, desde el primer momento se trabajó en la seguridad en la prescripción, llegando a la revisión y validación del 100% de los tratamientos, una vez instaurada la prescripción electrónica. La creación de una

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Hospital drug distribution systems; Crisis intervention.**PALABRAS CLAVE**Servicio de Farmacia Hospitalaria; Farmacéutico clínico;
Coronavirus; SARS-CoV-2; Pandemia; Atención Farmacéutica;
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cription protocols, therapeutic equivalences, interactions, and drug dispensing circuits.

The Pharmacy Department strategy was to ensure a very quick response to basic tasks keeping the aim to offer a pharmaceutical care of the highest quality whenever possible.

Working under a health emergency situation, with many uncertainties and continuous pressure was a plight. However, the spirit of collaboration in and out of the Pharmacy Department was aligned with the whole hospital motivation to offer the highest quality of healthcare. These were possibly the keys to allow caring for almost 4,000 patients during the 42 days that the hospital lasted.

Introduction: challenges and objective

The IFEMA COVID-19 Hospital (HC-19I) opened its doors on March 21st as a field hospital to confront the health emergency¹. The team of pharmacists of the regional health system of the Community of Madrid (SERMAS) involved in the setting up and organization of the pharmacy service (PS) learned of its opening the same day we arrived to the exhibition center, more specially, to the self-service area, which would be our place of work for the following weeks.

One of the first challenges was that rapid action was required. We had to respond urgently to the needs of patients expected to be admitted the same day, as beds were still being installed.

Another difficulty was that decisions had to be made in a climate of uncertainty. The IFEMA hospital was expected to have up to 5,000 hospitalization beds, 500 additional intensive care (ICU) beds, and a dubious temporal horizon. HC-19I was dominated by uncertainty since it opened its doors. Thus, decisions and instructions changed uHPated daily as the health situation evolved.

In this scenario, the vision of the PS was to guarantee quality and emergency pharmaceutical care of patients from the very first moment they were admitted to HC-19I on the awareness that the PS was working on a field hospital.

The initial specific objectives were:

- Obtaining urgent authorization for the setting up of the PS.
- Integrating a computer-assisted pharmacy management system that facilitated pharmaceutical validation and as well as compatible with the electronic medical record and prescription systems of the HC-19I.
- Adequate staffing: hospital pharmacists, pharmacy technicians, administrative personnel and hospital porters.
- Allocation of the equipment necessary for the PS: computers, shelves, narcotic cabinets, stationery supplies, etc.
- Acquiring the medication required for COVID-19 patients admitted to HC-19I.

Developed strategy: design, chain of supply and stages, implantation

On March 20th, the Regional Department of Health issued Order 371/2020, which authorized the equipment of the IFEMA exhibition center as a temporary healthcare center with capacity to host COVID-19 patients.

On March 22nd, 2020, the General Directorate of Healthcare Inspection and Organization authorized the installation and activity of the PS.

The first challenge was to guarantee the availability of the drugs necessary to meet the needs of the first patients admitted to pavilion 5, a temporary, roomy space with five nurses' stations serving 50 patients each, with paper medical records and prescriptions, and about 150-200 daily admissions. Initially, patients were referred from the Emergency Room of their hospitals of reference with enough medication for the first days of hospitalization.

The first step consisted of sending requests for borrowing drugs from other SERMAS hospitals. The selection of medication was based on the

Comisión de Farmacia y Terapéutica multidisciplinar permitió consensuar la guía farmacoterapéutica, protocolos de prescripción, equivalencias terapéuticas, interacciones y circuitos de dispensación de medicamentos.

La estrategia del Servicio de Farmacia se basó en asegurar una respuesta rápida en las funciones básicas, sin perder la visión de incorporar una atención farmacéutica de la máxima calidad posible a medida que iba siendo factible.

A pesar de un escenario adverso, de incertidumbre y presión continuas por la emergencia sanitaria, se ha mantenido un espíritu de colaboración y contribución dentro y fuera del Servicio de Farmacia, alineado con un objetivo común de trabajo en equipo para brindar una atención sanitaria rápida y de la mayor calidad posible. Posiblemente éstas han sido las claves del éxito que han permitido atender a casi 4.000 pacientes en los 42 días de vida del hospital.

floor stock of the COVID-19 wards of these hospitals and on the pharmacotherapeutic needs identified in collaboration with HC-19I professionals, according to the profile of the expected patients.

Two days after the hospital opened, the HC-19I PS agreed with a SERMAS hospital that the latter would order a supply of drugs to be delivered to HC-19I to guarantee a stock.

The establishment of a computerized pharmacy management system was prioritized. To such purpose, the structure and content of a drug master file were replicated, and the pharmacy management system was integrated with the electronic medical record system (including electronic prescription and pharmaceutical validation) of a SERMAS hospital where these systems were already in operation. A space was fitted out to ensure an appropriate receiving, storage, safeguard, and management of drugs.

A direct buying procedure was established with the appropriate selection of suppliers and price checking: A direct purchase process through a drug deliverer was also established under the SERMAS framework agreement to meet urgent and/or specific needs of particular patients.

Direct supply from laboratories included a series of orders processed by the HC-19I PS during the AEMPS-controlled distribution period², which were distributed to other hospitals in order to simplify and facilitate procurement procedures in critical situations, in accordance with the instructions of the Pharmacy and Medical Devices Department.

In the face of potential shortages of supply, the procurement of some medicines (sedatives, muscle relaxants, to name a few) was controlled by the Spanish Agency of Medicines and Medical Devices (AEMPS) and Regional Health Services.

During this period of controlled distribution² the management of the HC-19I PS also included a series of requests that were made and distributed to the rest of the hospitals from the HC-19I PS. The objective was to simplify and streamline management at critical moments for the rest of the hospitals and it was done following the instructions of the Pharmacy and Medical Devices Department.

A total of 391 purchase orders were made, with 613 lines of medicines.

The second challenge was to guarantee and organize drug dispensing.

In Pavilion 5, the floor stock method was used. In the meanwhile, two further pavilions, 9 and 7, were fitted out and structured into compartments, with 15 and 10 nurses' stations (NS), respectively and 50 beds each including an area for the storing and preparation of medicines plus an intensive care unit with 8 beds.

The stock replacement system was established in nurses' stations^{3,4} and ICUs^{5,6}. Drugs were organized in drawer shelves installed in nurses' stations as they were set up, in a daily basis of four stations (200 patients). Nine days after the hospital opened, the dispensaries of 25 nurses' stations, the ICU and the Unit of Radiology were fully stocked. This met the needs of approximately 1,260 patients. Crash trolleys were installed later.

Restocking was managed from nurses' stations using computer systems. A total of 993 requisition forms were submitted, with a total of 189,294 units dispensed.

Restocking and individualized dispensing systems were designed for medications not available in the cabinet or in the Pharmacotherapeutic Guide (PG) which were considered necessary for the patient. Prior to the establishment of the electronic prescription system, prescriptions were communicated by phone or by e-mail. Once electronic prescription was established, the PS validated the prescription and dispatched individual medication daily. A total of 17,188 units were prepared for 1,469 patients. Special prescription and/or dispensing systems were designed for medication orders under the AEMPS-controlled distribution or off-label use (tocilizumab, anakinra, lopinavir/ritonavir or hydroxychloroquine)^{2,7}.

As in other hospitals and in compliance with the Resolution of the General Directorate of Economic and Financial Management and Pharmacy, which regulated medicine dispensing and hospital pharmacy activity during the state of alarm, discharge medication was provided to patients discharged to repurposed hotels⁸. The PS supplied patients with enough individual medication for the quarantine in the hotel. To such purpose, the pharmacy prescription system, patient's discharge report and medical record browser (primary and secondary care), were reviewed when necessary. A total of 431 discharges were recorded, with 16,932 units dispensed corresponding to 2,013 lines of drugs.

Once drug procurement and dispensing were guaranteed and considering that many prescribers were not familiar with electronic medical record and prescription system the third challenge faced was guaranteeing the safety.

Pharmacotherapeutic protocols were jointly designed with clinicians to promote a prompt, easy and safe prescription procedure. The data required in electronic prescription protocols included the name of the drug, dose, route of administration, dilution, infusion rate and duration of treatment, yielding a total of 35 protocols, 7 for hospitalization wards⁹ and 28 for the ICU¹⁰.

Additionally, to facilitate access of prescribers to the drugs available in the hospital PG, two folders were created in the protocol section providing well-structured information that enabled clinicians to search for the available drugs and fluid replacement therapies. In total, 125 drugs were included in subfolders sorted in alphabetical order by therapeutic group containing predefined standard dosage instructions.

After electronic prescription was established, pharmaceutical validation¹¹ was performed in 100% of patients, with priority given to reconciliation at admission and discharge, the duration of treatment, dose adjustment for renal insufficiency, and possible drug interactions¹² between the specific treatment for COVID-19 and the regular medication of the patient.

As a result, validations were performed for 2,221 patients in relation to 108,502 lines of medicines, with a mean of 3.2 validations per prescription. In total, 924 pharmacotherapeutic recommendations were made, with a high rate of acceptance.

Few weeks after the opening of the hospital, a multidisciplinary Pharmacy and Therapeutic Committee was set up at the proposal of hospital physicians. This Committee provided first-hand information on the pharma-

cotherapeutic needs of the hospital and endorsed the PG, the different drug dispensing systems, a prescription based on therapeutic equivalents, prescription protocols and possible drug interactions.

Lessons learned. Future applicability in pharmacy services

The strategy developed for the start up of the PS, which was strained with shortage of supplies and the need to meet the established goals, involved rapid action in basic PS tasks, with the ultimate purpose of establishing a top-quality pharmacy service as soon as possible.

We focused on meeting immediate needs, which were drug procurement and dispensing. These tasks evolved and were improved over time as more resources became available.

However, since the very first day, we were aware that hospital pharmacists can contribute added value to patient care and safety and, in parallel with our routine activity, the PS focused on developing protocols, facilitating electronic prescription and ensuring quality pharmaceutical validation as soon as the electronic prescription system was established.

In summary, action first followed by improvement and adaptation to a changing environment.

In the face of a challenging scenario of health emergency, huge workload, need for immediate start up, and great uncertainty, the key to success was the collaborative spirit of the PS staff and cooperation between all HC-19I professionals. This cohesive team had the shared objective of providing rapid quality healthcare to the 3,812 patients admitted to the field hospital. This experience has left an imprint on the hearts of the professionals who have worked in HC-19I. We have learnt to put our professional competence and human quality at the service of the population, which evidences the most important value of our profession, the ability to change the reality of people¹³.

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Bibliography

1. Real Decreto 463/2020, de 14 de marzo, por el que se declara el estado de alarma para la gestión de la situación de crisis sanitaria ocasionada por el COVID-19. Boletín Oficial del Estado, n.º 67 [14 de marzo de 2020].
2. La AEMPS informa de la distribución controlada de todo el stock de hidroxycloquina/cloroquina [Internet]. Nota informativa AEMPS 12/2020 [accessed 03/23/2020]. Available at: <https://www.aemps.gob.es/informa/notasInformativas/laemps/2020-laeemps/la-aemps-informa-de-la-distribucion-controlada-de-todo-el-stock-de-hidroxycloquina-cloroquina/>
3. Manejo clínico del COVID-19: atención hospitalaria [Internet]. Ministerio de Sanidad; 2020 [accessed 03/19/2020]. Available at: https://www.msbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov-China/documentos/Protocolo_manejo_clinico_ah_COVID-19.pdf
4. Centro de coordinación de alertas y emergencias sanitarias. Enfermedad por coronavirus, COVID-19 [Internet]. Ministerio de Sanidad; 2020 [accessed 04/17/2020]. Available at: https://www.msbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov-China/documentos/20200417_ITCoronavirus.pdf
5. Manejo clínico del COVID-19: unidades de cuidados intensivos [Internet]. Ministerio de Sanidad; 2020 [accessed 03/19/2020]. Available at: https://www.msbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov-China/documentos/Protocolo_manejo_clinico_uci_COVID-19.pdf
6. Recomendaciones de la AEMPS para la gestión de medicamentos para el actual manejo de pacientes con enfermedades en fase terminal o paliativa en la situación sanitaria [Internet]. Nota Informativa MUH, 8/2020 [accessed 03/31/2020]. Available at: https://www.aemps.gob.es/informa/notasInformativas/medicamentos/UsoHumano/2020/Ni-MUH_08-2020-medicamentos-paliativos.pdf?x33378
7. Tratamientos disponibles para el manejo de la infección respiratoria por SARS-CoV-2 [Internet]. Agencia Española de Medicamentos y Productos Sanitarios; 2020 [accessed 03/30/2020]. Available at: <https://www.aemps.gob.es/laemps/ultima-informacion-de-la-aemps-acerca-del-covid19/tratamientos-disponibles-para-el-manejo-de-la-infeccion-respiratoria-por-sars-cov-2/?lang=en>

8. Protocolo de derivación de pacientes con COVID-19 a hoteles sanitizados de la Comunidad de Madrid. Consejería de Sanidad de Madrid; 28 de marzo de 2020.
9. Información a los profesionales sanitarios sobre la distribución de medicamentos relacionados con el tratamiento de COVID-19 [Internet]. Agencia Española de Medicamentos y Productos Sanitarios; 2020 [accessed 03/19/2020]. Available at: <https://www.aemps.gob.es/laaemps/>
10. Recomendaciones de la AEMPS para la gestión de medicamentos de uso habitual en las unidades de cuidados intensivos [Internet]. Nota Informativa MUH 7/2020 [accessed 03/27/2020]. Available at: <https://www.aemps.gob.es/informa/notasInformativas/medicamentosusohumano-3/2020-medicamentosusohumano-3/recomendaciones-de-la-aemps-para-la-gestion-de-medicamentos-de-uso-habitual-en-las-unidades-de-cuidados-intensivos/>
11. La AEMPS informa sobre el buen uso de medicamentos relacionados con COVID-19 [Internet]. Nota Informativa MUH, 9/2020 [accessed 04/06/2020]. Available at: <https://www.aemps.gob.es/informa/notasInformativas/medicamentosusohumano-3/2020-medicamentosusohumano-3/la-aemps-informa-sobre-el-buen-uso-de-medicamentos-relacionados-con-covid-19/>
12. Cloroquina/Hidroxiclороquina: precauciones y vigilancia de posibles reacciones adversas en pacientes con COVID-19 [Internet]. Nota informativa MUH (FV), 7/2020 [accessed 04/22/2020]. Available at: https://www.aemps.gob.es/informa/notasInformativas/medicamentosUsoHumano/seguridad/2020/docs/NI_MUH_FV-7-2020-Hidroxiclороquina.pdf?x50414
13. Escobar I. Tiempos de incertidumbre. Tiempos de cambio. Rev. OFILILAPHAR 2020;30;2:95.