



Schweizerischer Verein der Amts- und Spitalapotheker Association suisse des pharmaciens de l'administration et des hôpitaux Associazione svizzera dei farmacisti dell'amministrazione e degli ospedali Swiss Association of Public Health Administration and Hospital Pharmacists

Roles and challenges of a Swiss interhospital pharmacy during the COVID-19 pandemic

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BACKGROUND

From March 16 to June 18, 2020, because of the COVID-19 pandemic, the Swiss Federal Council declared an "extraordinary situation" in terms of the Epidemics Act.

In this context, the roles of an interhospital pharmacy in the fight against SARS-CoV-2 were assessed.

METHODS

- All missions performed by our pharmacy, The "Pharmacie des Hôpitaux" de l'Est Lémanique (PHEL)", were systematically collected and evaluated.
- They were also compared to its official duties.

RESULTS

MISSIONS

The specific missions carried out by the various pharmacy sectors during spring 2020 are summarized in Table I and illustrated in Pictures 1-5.

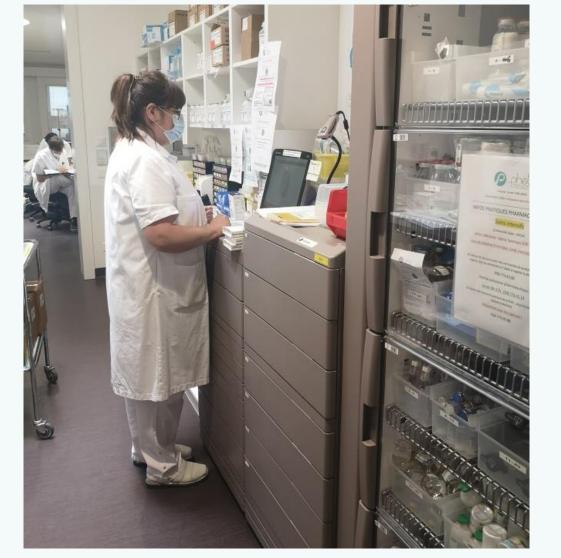
Table I. Specific missions of the pharmacy during the first COVID-19 wave

Missions	Examples of actions
Guarantee continuity of human resources	 Creation of a continuity planning Request for civil defence support
Internal infrastructure securing (especially in terms of hygiene)	 Elaboration of a protection plan (incl. hygiene procedure)
Specific drug supply (e.g. anaesthetics, sedatives, antivirals, incl. for clinical trials)	 Close monitoring of stocks Pharmaceutical management of the Solidarity trial
Hand sanitizers production and supply	Restriction of deliveriesOwn production of hand sanitizers
Clinical assistance (especially in the critical care units, ICU)	 Systematic treatment reviews Definition of therapeutic alternatives Elaboration of support documents
Individual drug manufacturing	 Fabrication of unavailable forms Preparation of kits in wards
Management of ward pharmacies	 Management of stocks Daily medicine trays preparation
Hygienic masks distribution to healthcare professionals	 Distribution of the national strategic stock of hygienic masks



Figure 1. Supply of rocuronium originally dedicated to Korea







A particular challenge was the management of the shortage of various drugs

Figure 2. Production of hand sanitizers

Figure 3. Management of the ICU pharmacy

Médican	de l'Est Lémanique	ıx Soins-intensifs et pr	écaution d'emploi		PH	EL.FP.305
	Azithromycine®	Hydroxychloroquine [®]	Remdesevir	Actemra®	Kaletra®	Reyataz®
Formulations	Comprimé : 250mg ou 500mg Suspension buvable : 200mg/5ml	Comprimé : Hydroxychloroquine 200 mg Suspension buvable : 25 mg/ml, 100 ml	Fioline sèche : GS-5734 100 mg	Tocilizumab Solution à diluer pour perfusion 20 mg/ml, 20 ml	Comprimé : Lopinavir 200 mg +ritonavir 50 mg Sirop : Lopinavir 80 mg/ml + ritonavir 20 mg/ml	Capsules : atazanavir 200 mg
Indications	Selon algorithme ICHV	Selon algorithme ICHV	Selon algorithme ICHV	Selon algorithme ICHV	N'est plus utilisé pour l'instant (sauf cadre essai clinique)	N'est plus utilisé pour l'instant
Contre- indications	-	 Déficit en G6PD Psoriasis Porphyrie Anémie hémolytique Rétinopathie (si traitement à long terme) Myasthénie Champ visuel réduit Grossesse Procréation->3 mois post traitement 	 inconnues IR avec Cir < 30 ml/min 	Fernmes enceintes ou allaitantes Neutropénie ou thrombopénie <50g/l ASAT et ALAT>5 fois la limite de référence supérieure Infections bactériennes ou fongiques sévères	 Insuffisance hépatique sévère Wyccardite Intractions majeures via CYP Trouble du rythme Hypokalémie (corrispable) Sirop : contre- indication si IR sévère 	 Insuffisance hépatique sévèr ou modérée Interactions majeures via CY
Précaution/ suivi biologique	ECG (risque d'allongement intervalle Q1) Suivi de la fonction hépatique	 Cardiomyoptahie -> contrôle clinique des signes et symptômes Si FEVG abaissée avant début traitement-> avis cardio Arythmie, prolongement intervalle QT-> ECG Cl si QT>500 ms ou augmentation de >50 ms Hypoglycémie-> suivi glycémique Formule sanguine CAVE hypokaliémie et 	inconnues	 Dépistage tuberculose latente et hépatite B Prévoir avant administration le dosage des cytokines et des sous-populations cellulaires par cyTOF (voir Refmed), Dosage à répéter à 72h- Enzymes hépatiques 	Test HIV Labo (FS, Rein, folie) kalièmie kalièmie	 Augmentation billrubine >n resp pas une Cl Protongement intervale QT-> ECG Cl sl QT>500 ms ou augmentation de >50 ms

Figure 4. Elaboration of pharmaceutical assistance documents

Table II. Examples	of specific drugs	close to shortage in our pharmacy
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Drugs	Example of alternatives
Propofol	 Sedation based on ketamine and midazolam
Atracurium	 Rocuronium discontinuously
Remdesivir	• None

products and the identification of alternative therapeutic options (Table II).

REFERENCES

L. Schumacher, et al. *Méd Catastrophe Urg Collectives* 2020; 4(3): 223-32.

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CONCLUSION

- Our pharmacy has faced various challenges during the first wave of the COVID-19 pandemic in Switzerland.
- Some missions performed were even beyond its traditional duties and have been achieved with the support of the Swiss civil protection (hand sanitizers production and hygienic masks distribution).
- Based on the lessons learned from this extraordinary situation, the disaster plan of our pharmacy, as well as the associated staff training, have been further developed.