

## Special Article - Anticoagulants

# Anticoagulation Clinical Pharmacist: Anticoagulation Care between the Headset and the Dial Pad

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## Abstract

Anticoagulant is a class of medication that saves lives while carries an intrinsic risk of harm. The American College of Chest Physicians Consensus Conference on Antithrombotic Therapy for the first time in 1995 endorsed the setting of specialized anticoagulation clinics instead of usual medical care. Recently telemedicine is not a brand-new method of patient care, yet, telemedicine utilization has increased dramatically during the last year to comply with the curfew that most cities of the world had to apply to reduce the spread of COVID-19. Telemedicine and especially anticoagulation care need careful systems, the minimum infrastructure of patient records including telephone contact number, facility telephone, and clinic appointment system. The top three challenges when applying telehealth are payment, confidentiality, and un-updated patients' information.

**Keywords:** Clinical pharmacist; Health care telephone interview; Telehealth; Tele-pharmacy; Anticoagulants

## Introduction

Anticoagulants or “blood thinners” are the medications used to reduce the blood coagulability.

Heparin was first isolated in 1916 by the young medical student Jay Mclean at Howell's laboratory at John Hopkins University, then it took twenty years for the first purified heparin to be developed in Stockholm in 1935 [1,2]. Vitamin K Antagonists (VKA) is the first class of oral anticoagulants, dicumarol was identified in 1940 by Karl Paul Link and his associates at the University of Wisconsin; ten years later warfarin was introduced to the practice [3]. For fifty-five years VKA were the only available oral anticoagulants but the quest to develop the ideal anticoagulant continued. Major advancements were made during the past decade and a half, the era of the Direct Oral Anticoagulants (DOACs) which possess some advantages over VKA such as fewer interactions with food and drugs and their fixed doses that do not require routine monitoring. Two classes of DOACs are available, direct thrombin inhibitors (Dabigatran Etxilate) and factor Xa inhibitors such as Rivaroxaban, Edoxaban, Apixaban and Betrixaban.

The main indications for oral anticoagulants are the treatment and prevention of venous thromboembolism, treatment, and prevention of the stroke and embolism in patients with atrial fibrillation, and prevention of thromboembolic complications associated with cardiac valve replacement.

Despite their huge benefit in reducing morbidity and mortality, anticoagulants carry an innate risk of an increased bleeding tendency which could be fatal. So continuous surveillance and balancing between benefits versus risk is needed. Successful anticoagulation utilization triad is a combination of “a vigilant physician, a cooperative patient, and a readily available, reliable laboratory”, as noted by Askey and Cherry [4].

The setting of specialized anticoagulation clinic instead of usual medical care started to get attention when it was endorsed by the American College of Chest Physicians Consensus Conference on Antithrombotic Therapy for the first time in 1995 [5]. Anticoagulation clinics provide at least two of the three aspects of Askey and Cherry's triad of optimal anticoagulation care, vigilant “practitioner” and readily reliable testing; we believe that the third aspect of the triad, patients' cooperation, is better reached in the more consistent clinical settings such as anticoagulation clinic [6]. Many studies have shown that specialized anticoagulation clinics have better patients' outcomes over the usual medical care [7-9].

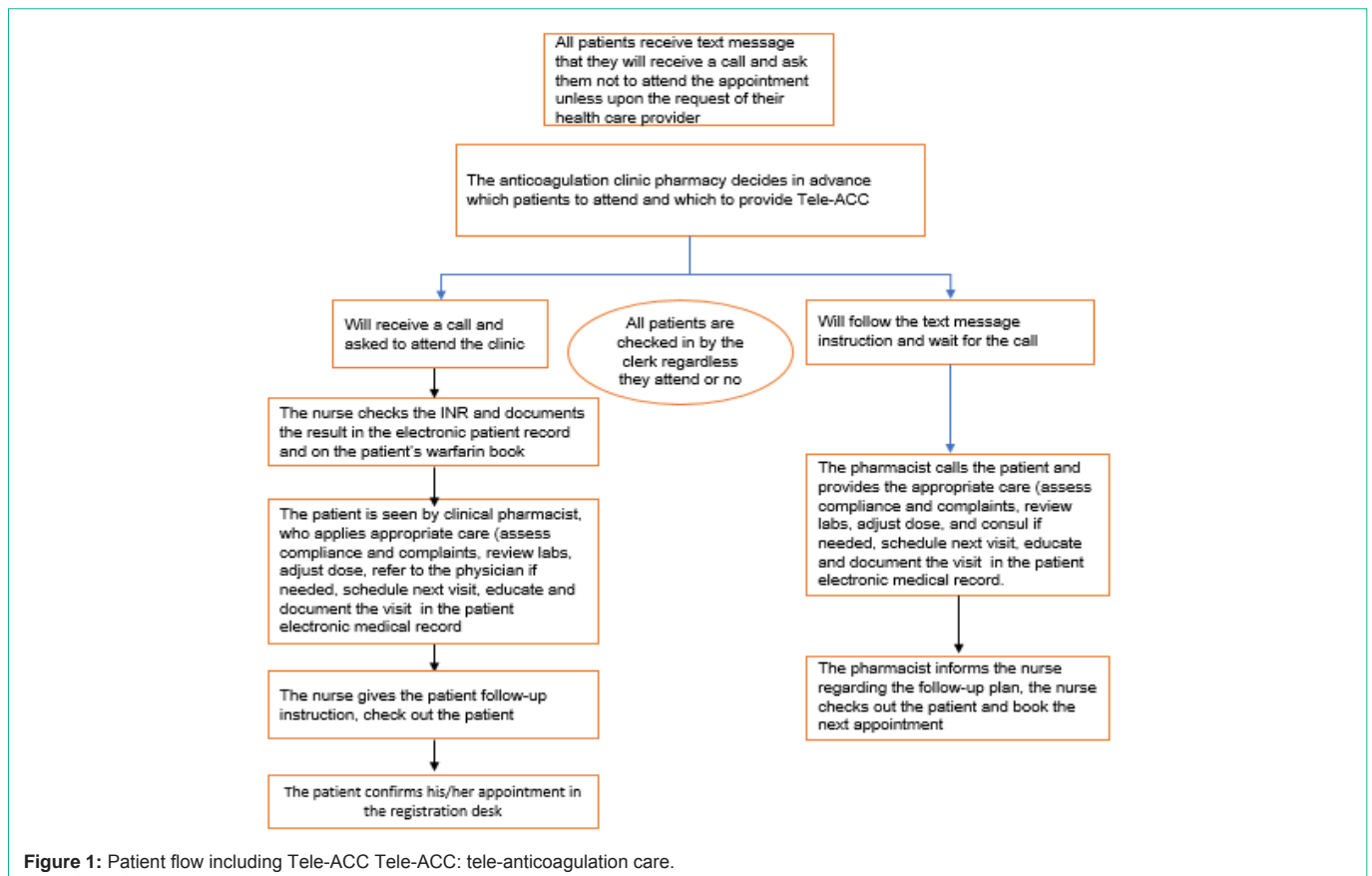
## Hamad General Hospital-Anticoagulation Clinic

### Patients and setting

Since started in 2016, Hamad General Hospital (HGH) Anticoagulation Clinic (ACC) embraced the collaborative approach. The clinic is run by certified clinical pharmacists who work in collaboration with physicians and nurses [10]. The clinic serves primarily patients who are on anticoagulation for non-cardiac indication (i.e. venous and arterial thrombosis) patients. Patients on warfarin and Direct Oral Anticoagulants (DOACs) both are followed in the clinic. Figure 1 shows the patients' flow.

### Paradigm shift

Before March 16, 2020, all patients were managed during face-to-face visits. The average number of daily patients was around twenty patients per day and counts for about four-hundred visits per month. Following the World Health Organization declaration of COVID-19 as a pandemic, all outpatient visits had been suspended and patients were announced not to report to their appointments and to wait for their doctors' calls. The necessity of patients' visits to the clinics were left to be decided by the physicians in charge. This was the beginning of the official telemedicine utilization at Hamad Medical Corporation



**Figure 1:** Patient flow including Tele-ACC Tele-ACC: tele-anticoagulation care.

(HMC) [11].

Tele-anticoagulation care resembled a challenge as most patients following at the ACC were on warfarin (%). So, we had to set a plan to achieve compliance with the HMC instructions of minimizing the number of patients attending the clinic while putting into consideration the necessity of INR monitoring.

We stratified the patients into two categories:

- The patients who can be provided Tele-Anticoagulation Care (Tele-ACC).
- The patients who cannot be provided Tele-Anticoagulation Care (Tele-ACC) and must be seen in the clinic.

In this article we are going to focus on the Tele-ACC only:

The patients who can be provided Tele-Anticoagulation Care (Tele-ACC): a) Patients on DOACs; b) Patients who are eligible for INR recall extension; c) Patients who can monitor their INR remotely (i.e. self-check, Home Health Care Service (HHCS), Primary Health Center (PHC), or private labs). Figure 2 shows the new patient flow to include tele-anticoagulation care.

## Elements of Tele-Anticoagulation Care

To implement telehealth the clinician should have the access to the minimum infrastructure of:

- Patients' contact number directory.
- Landline or a corporate mobile phone.

- Access to the appointments' schedule.

In our example, pharmacists who were running the clinic had full access to all three.

### Tele-ACC for Patients on DOACs

No routine laboratory test is required to manage patients on DOACs, and medical examination is not necessary most of the time. So, this group of patients is the most straight forward to be managed remotely. Each patient would be managed as the following:

**Patient's file review:** Minimum file review is to check the anticoagulation plan (i.e. indication, duration, etc.), latest lab results, and last ACC notes. All patients on DOACs should have at least annual renal and liver function tests, and complete cell count; frequency increases in patients with comorbidity [12].

**Patient interview:** Patient is contacted over the phone. The anticoagulation pharmacist interviews the patient to assess:

- **Compliance:** Missed dose is assessed by asking the patient about the number of doses that s/he missed in the previous seven to ten days and the estimated number of tablets remaining from the last fill.
- **Complaints:** Mainly gastrointestinal tolerance and if any suspected new side effects.
- **Medication:** Changes in prescribed and OTC medication.
- Signs and symptoms of bleeding or thrombosis.

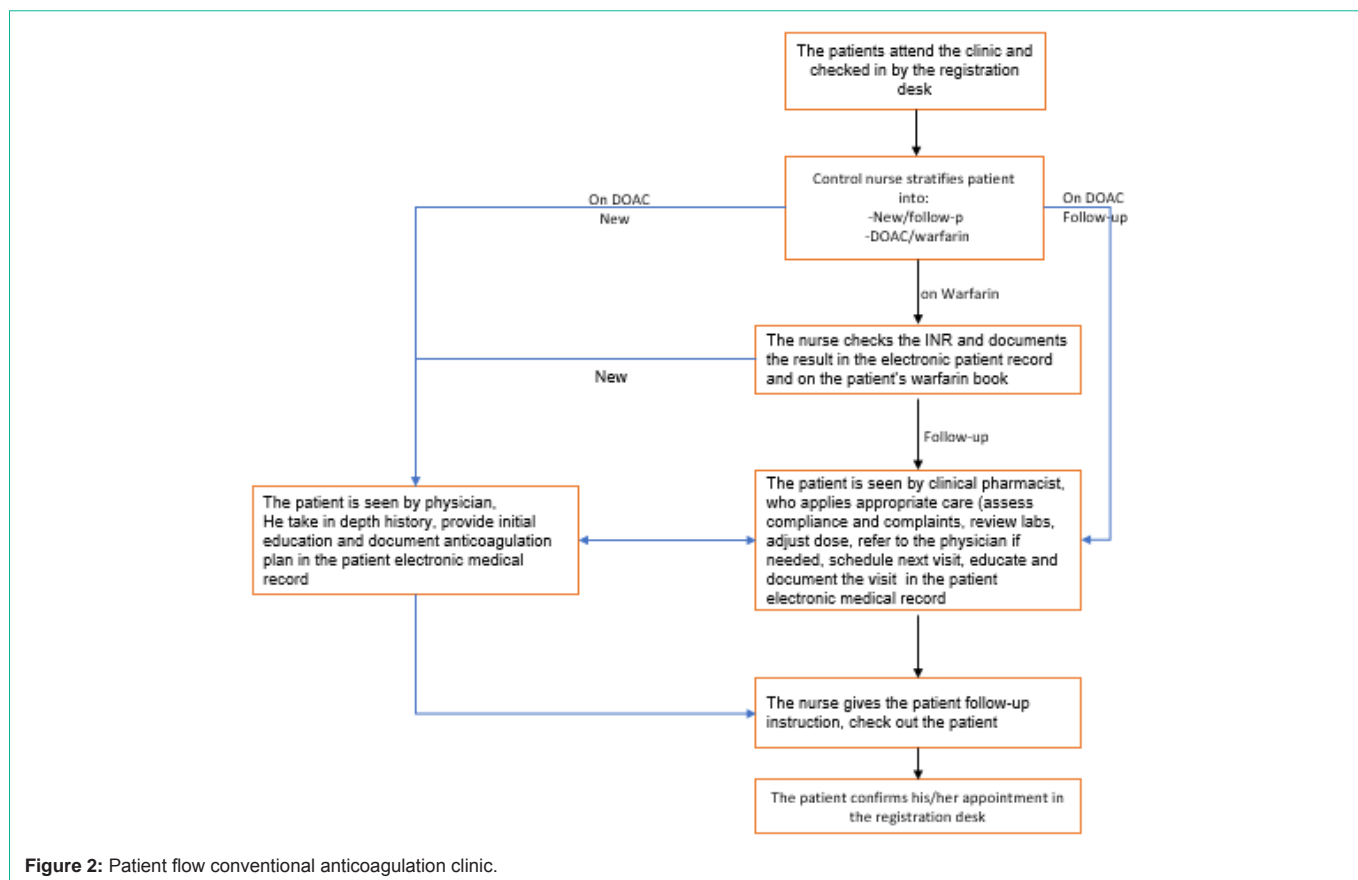


Figure 2: Patient flow conventional anticoagulation clinic.

Then, the patient is asked if s/he has any concerns. At the end of the call, the anticoagulation pharmacist provides the patient with the plan and assesses patient understanding by read-back.

**Documentation:** The anticoagulation clinic pharmacist documents the interview in the patient’s Electronic Medical Record (EMR) and includes a detailed statement regarding all up-mentioned points, the plan, and the next follow-up.

**Tele-ACC for patients eligible for INR recall extension**

INR recall interval extension for patients with long term stable therapeutic INR has been studied and proven safe when it is carefully applied [13,14]. The anticoagulation forum indorsed INR recall extension to be used as a measure to reduce patients’ unnecessary visits to the clinic [15]. INR recall interval depends on the patient time spent on the same dose while INR is maintained within the therapeutic range. The maximum interval between INR checkups is three months is to be offered for patients who maintain the same warfarin dose for at least six months and achieve therapeutic INR readings in most of the visits without any critical readings or severe fluctuations.

**Elements of tele-anticoagulation care for patients offered INR recall extension**

At the beginning the anticoagulation clinic pharmacist will review the patient’s file. Minimum file review is to check the anticoagulation plan (i.e. indication, duration, etc.), the latest INR date and result, and last ACC notes. Patients who are eligible to have their INR check postponed are identified and tagged then a structured phone

interview is conducted to address the following elements:

- **The current dose:** It must be identical to the documented dose that is associated with the maintenance of therapeutic INR, if it is not, the anticoagulation pharmacist should clarify the duration since new dose and if recent INR appointment will be scheduled.
- **Compliance:** Missed doses is assessed by asking the patient about the number of doses that s/he missed in the previous seven to ten days and the estimated number of tablets remaining from the last fill.
- **Diet:** Change in the consumption of Vitamin K containing food.
- **Herbs:** Changes in herbs use.
- **Medication:** Changes in prescribed and OTC medication.
- Signs and symptoms of bleeding or thrombosis.
- Ask the patient if s/he has any concerns.
- **Documentation:** The anticoagulation clinic pharmacist documents the interview in the patient’s Electronic Medical Record (EMR) and includes a detailed statement regarding all up-mentioned points, the plan, and the next follow-up.

If the patient reported a significant change in the consumption of vitamin K containing food, herps, medication, or if the patient addressed any sign or symptom that suggests off range INR, the patient should be disqualified from extending his INR recall. The

anticoagulation clinic pharmacist should give an appointment to check the INR in the clinic or remotely if the patient has access to a remote INR checking modality.

### Tele-ACC for patients who have access to remote INR monitoring (self-test, PHCC, HHCS)

Some patients have access to check INR in PHC or at home by self-testing, or through HHCS. So obviously these patients are not required to attend the clinic unless there is a concern regarding the remote test result, otherwise tele-anticoagulation care will be provided. First step would be EMR review as mentioned above then a structured phone interview will be conducted to address the following elements:

- The current dose.
- **Compliance:** Missed doses is assessed by asking the patient about the number of doses that s/he missed in the previous seven to ten days and the estimated number of tablets remaining from the last fill.
- **Diet:** Change in the consumption of vitamin K containing food or if planning for such change.
- **Herbs:** Changes in herbs use.
- **Medication:** Changes in prescribed and OTC medication.
- Signs and symptoms of bleeding or thrombosis.
- Ask the patient if s/he has any concerns.
- The anticoagulation clinic pharmacist documents the interview in the patient's Electronic Medical Record (EMR) and includes a detailed statement regarding all up-mentioned points, the plan, and the next follow-up.

### Challenges and Limitations

Although tele-anticoagulation care has provided a scape for managing a busy anticoagulation clinic during the COVID-19 pandemic. The main advantage was that we had the minimum number of patients to attend physically. We cannot ignore the challenges that we faced and the obstacles to carry on this practice as a new normal.

The major challenge was reaching the patients. Many times, we were not able to get in contact with patients because of any of the following:

- The patients miss calls as they are working or driving during the call. Sometimes they will call back after the clinic hours, so we miss their calls!
- Some patients ignore the call because they do not recognize the clinic number.
- A wrong telephone number in the patient record.
- Female patients provide their husband's phone number.

Other known challenges are:

- Payment, we did not have a system that allows the patients to pay for their tele-appointment, so all patients were exempted from the clinic fee if they were provided tele-anticoagulation care.
- Patient confidentiality, mainly the lack of an encrypted phone call system.

### Conclusion

Tele-anticoagulation care can be utilized to provide safe and effective patient care. If adopted clear guidelines need to be developed and a careful system needs to be built. The guidelines need to focus on the standardization of patient interviews, while the system should focus on how to overcome the crucial obstacles of payment and patient confidentiality.

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