CHAPTER 9

ANTICOAGULATION REVERSAL: PART II—CLINICAL APPLICATION

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INTRODUCTION

Bleeding, or concerns for bleeding during anticoagulation therapy, may at times create a need to lower or completely reverse the existing intensity of anticoagulation. Besides holding the anticoagulant or managing the bleeding directly, additional agents may be considered to counter the anticoagulant's effects. Such agents may directly reverse the anticoagulant's pharmacological effects or independently drive normal coagulation (hemostasis). Several drivers for bleeding or bleeding events may be present and should be identified. Multiple factors are involved in finding the optimal approach to minimize bleeding consequences while limiting the risk for a thrombotic event. This chapter will provide insights into developing a strategy for reversing anticoagulation.

REVERSAL CONSIDERATIONS

Questions to Ask When Deciding the Best Approach to Reverse the Effects of an Anticoagulant

- What is the goal with the reversal?
    - Stop or just slow active bleeding.
    - Completely reverse or lower the intensity of anticoagulation (see **Figure 9-1**).
    - Prevent a potential bleeding event.
- What is the risk for thrombosis (surgical procedure, use of hemostatic agents, or initial reason for anticoagulation)?
- How long do we need to reverse?
    - Can we bridge if necessary (i.e., to warfarin)?
    - Is there an indication suggesting limited break in anticoagulation desired?
- Is there an active bleed, or high risk situation present?
- Will the reversal plan create additional challenges?
    - Restarting anticoagulation.
    - Prolonged hospital stay.

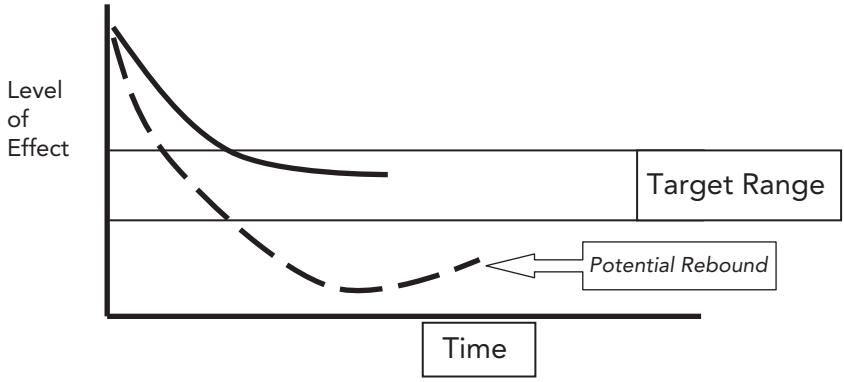

FIGURE 9-1. **Goal Anticoagulation Intensity of Reversal Plan**[a]

[a]Reversal targets may depend on the current use of anticoagulation, and how far the reversal and intended level of anticoagulation to achieve is. The goal may be partial—down to the target range (solid line), or some value below the target range (broken line). Thus, the amount of reversal may depend on the initial level of anticoagulation and the final target goal to achieve. A rebound may occur if the duration of effect from the reversal agent is shorter than the anticoagulant.

Considerations During the Development of a Reversal Plan

End Target Goal

One of the goals of reversal is to not only control and potentially stop the bleeding, but to also identify and correct the source or cause. In some forms of bleeding (e.g., gastrointestinal bleeding), full cessation of bleeding using hemostatic agents may limit the ability to identify and resolve—through other means—the bleeding source (1) to prevent potential recurrence as well as (2) to decrease concerns for recurrent events and increase confidence with re-initiating anticoagulation therapy.

- *Possible goal:* Slowing the bleed to identify the source and mechanically correct it.
- *Reversal plans:* Should consider the entire process from initiation of reversal and ability to re-initiate anticoagulation in a manner that avoids any later avoidable risks to the patient.

Clinician Considerations

- Pharmacodynamic and pharmacokinetic properties of the anticoagulant and separately the reversal agent
    - Onset and offset of effects for each.
        - *Duration of antidote effects **shorter** than the agent reversed:* Potential for re-bound in anticoagulant effects (Figure 9-1).