Suppose an individual who is willing to test tests on day T and tests positive with probability p. Then

$$R_T = R_0 \left\{ (1-p) + p\Lambda(T) \right\}$$

where $\Lambda(T) = \int_0^T \lambda(t)\,dt$.

Now suppose an individual who is willing to test will test on days $T_1, T_2, \dots, T_K$ and will test positive with probability $p_1, p_2, \dots, p_K$. If they test positive on day i, they will isolate from day i.

Then the sequence of testing can be modelled as a sequence of independent Bernoulli's s.t.

Test positive on test $i \sim \text{Bernoulli}(p_i)$.

Then

$$R_T = R_0 \left\{ \prod_{i=1}^{K} (1-p_i) + \sum_{i=1}^{K} p_i \underbrace{\Lambda(T_i)}_{(1)} \prod_{j<i} (1-p_j) \right\}$$

To allow for leaky isolation, replace

(1) with $\Lambda(T_i) + q_T(1-\Lambda(T_i))$

for $0 \le q_T \le 1$.

Then, to model different testing policies (ie. test on days 1 & 3 vs 4 & 7) we would replace

p_i with $\hat{p}_i = \delta_i p_i$

where δ_i is equal to one if testing on day i, and zero otherwise.