```mathematica
Exp_{m_,i_,k_}[P_] := Block[{$k = k},
  Module[{P0, λ, φ, φs, F, j, rhs, eqn, pows, at0, atλ},
   P0 = Normal@P /. ϵ → 0;
   F = Normal@Last@Exp_{m,i,k-1}[λ P];
   While[
    rhs =
     m_{i,j→i}[
         𝔼_{{}→{i}}[λ P0 /. (x | y)_i → 0, λ P0 /. (b | a | t)_i → 0,
             F]_k sσ_{i→j}@𝔼_{{}→{i}}[0, 0, P]_k] // Last // Normal;
    eqn = CF[(∂_λ F) + P0 F - rhs];
    eqn =!= 0, (*do*)
    pows = First /@ CoefficientRules[eqn, {y_i, b_i, a_i, x_i}];
    F += Sum[ϵ^k φ_{js}[λ] Times @@ {y_i, b_i, a_i, x_i}^{js},
      {js, pows}];
    rhs =
     m_{i,j→i}[
         𝔼_{{}→{i}}[λ P0 /. (x | y)_i → 0, λ P0 /. (b | a | t)_i → 0,
             F]_k sσ_{i→j}@𝔼_{{}→{i}}[0, 0, P]_k] // Last // Normal;
    eqn = CF[(∂_λ F) + P0 F - rhs];
    φs = Table[φ_{js}[λ], {js, pows}];
    at0 = Table[φ_{js}[0] == 0, {js, pows}];
    atλ = (# == 0) & /@
       (pows /. CoefficientRules[eqn, {y_i, b_i, a_i, x_i}]);
    F = F /. DSolve[And @@ (at0 ⋃ atλ), φs, λ][[1]]
   ];
   𝔼_{{}→{i}}[P0 /. (x | y)_i → 0, P0 /. (b | a | t)_i → 0,
    F + O[ϵ]^{k+1} /. λ → 1]]]
```