
Algorithm 1: Policy for storing and managing patient data

```
1:  $P_i = \{\{\text{Policy for storing and managing patient data, v1.0}\},$   
  (1, {patient, controller}, {whole},  
    {store_data, check_logs, revoke_consent}, 1),  
    {proof_document, verification_method}\}
```

2: **Input:** SubjectID, LoginRequest, CheckPolicy
3: **Output:** Action
4: Action = "Signup Required"
5: **if** ValidUser(SubjectID) AND CheckPolicyDetails **then**
6: Action = "Login Successful"
7: **function** subject_checkup()
8: **if** ControllerDetails() **and** FollowSubjectPolicy() **then**
9: StartCheckupOfPatient()
10: MedicalRecommendation()
11: StoreData()
12: SuggestTest()
13: PatientConsent()
14: **end if**
15: **end function**
16:
17: **function** Change_Consent()
18: **if** PatientWantsToChangeConsentType() **then**
19: SelectConsentType()
20: Print "Select the Types."
21: **end if**
22: **end function**
23:
24: **function** Revoke_Consent()
25: **if** PatientWantsToRevokeConsent() **then**
26: DataUsage = "None"
27: **end if**
28: **end function**
29:
30: **function** Check_Logs()
31: **if** UserDetailsAreValid() **then**
32: Display(HistoryOfMedicalDetails)
33: Print "History of Medical Details"
34: **end if**
35: **end function**
36: **else**
37: **function** Signup()
38: Print "signup"
39: Register(SubjectDetails)
40: Print "Subject Details"
41: **end function**
42: **end if**

Algorithm 2: Controller Policy for Data Management

```
1:  $P_c = \{\{\text{Managing patient data storage and AC, v2.0}\},$   
    $(1, \{\text{controller, patient}\}, \{\text{consent\_type, compliance}\},$   
    $\{\text{verify, store, access\_logs, process\_revoc,}$   
    $\text{receive\_access\_requests, manage\_audits}\}, 1),$   
    $\{\text{proof\_document, verification\_method}\}\}$   
2: Input: SubjectID, ControllerID, RequesterID, Data  
3: Output: Action  
4: Action = "Signup Required"  
5: if ValidUser(ControllerID) then  
6:   Action = "Login Successful"  
7:   ManageDataStorage()  
8:   EnsurePatientConsent()  
9:   ProvideAccessToConsentLogs()  
10:  ProcessConsentRevocation()  
11:  HandleAccessRequests()  
12:  ManageAuditsAndLogs()  
13: else  
14:   Signup()  
15: end if  
16: ManageDataStorage  
17: if ValidUser(SubjectID) then  
18:   StartCheckupOfPatient()  
19:   MedicalRecommendation()  
20:   SuggestTest()  
21:   StoreData()  
22:   PatientConsent()  
23: end if  
24: Providing_consent_logs  
25: if ValidUser(SubjectID) then  
26:   Action = "Logs Provided"  
27: end if  
28: ProcessConsentRevocation  
29: if ValidUser(SubjectID) and FollowSubjectPolicy() then  
30:   Action = "Revoke Consent"  
31: end if  
32: HandleAccessRequests  
33: if ValidUser(RequesterID) and FollowSubjectPolicy() then  
34:   Action = "Access Granted"  
35: end if  
36: ManageAuditsAndLogs  
37: if ValidUser(SubjectID) and FollowSubjectPolicy() then  
38:   Action = "Access Granted"  
39: end if  
40: ConductAudits  
41: Action = "Audits and logs managed by Controller"
```

Algorithm 3: Requester Access to Patient Data

```
1:  $P_{\text{req}} = \{\{\text{Policy for requesting access to patient data, v3.0}\},$   
    $(1, \{\text{req, con}\}, \{\text{purpose\_justify, compliance}\},$   
    $\{\text{submit\_request, justify\_purpose, adhere\_audit\_log}\}, 1),$   
    $\{\text{proof\_document, verification\_method}\}\}$   
2: Input: RequesterID, ControllerID, Purpose  
3: Output: Action  
4: if ValidUser(ControllerID) then  
5:   Action = "Login Successful"  
6:   ProvideAccessToData(RequesterID, RequestDetails, FollowSubjectPolicy)  
7:   LogAuditResults(RequesterID)  
8: else  
9:   Signup()  
10: end if  
11: if ProvideAccessToData(RequesterID, RequestDetails, FollowSubjectPolicy) then  
12:   Action = "Access Granted"  
13:   ProvideAccessToData(RequesterID, RequestDetails)  
14:   LogAuditResults(RequesterID)  
15: else  
16:   Action = "Invalid User"  
17: end if
```
