

NCH - PEDMATCH

Integration Overview, v1.0-draft

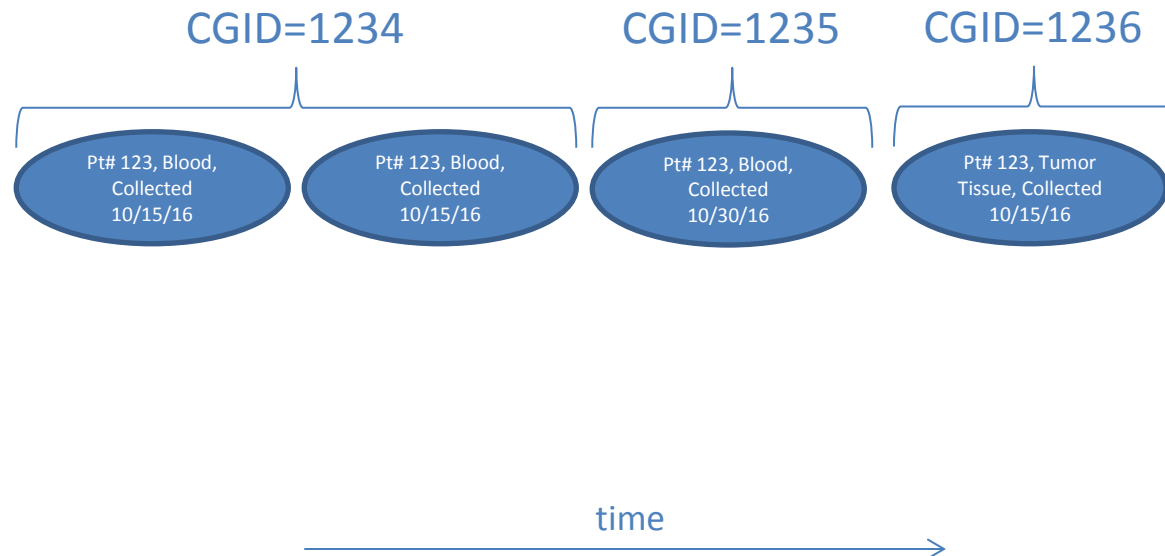
Last revised, 5/9/2016, ESK

Terminology

- Collection Grouping ID (“CGID”)
 - Shared by specimens of a given type taken from a patient in one encounter/surgery/draw/etc.
 - Same CGID means specimens are “equivalent” from a PED-MATCH standpoint
 - Specimen messages sent to MATCHBOX will include the CGID
 - CGIDs will be “inherited” by the various aliquots/derivatives from the original specimens
 - Specimens obtained through follow-up requests by BPC (e.g., inadequate/insufficient received) will keep the original CGID if specimens are known to come from the same original encounter/surgery/block/etc.

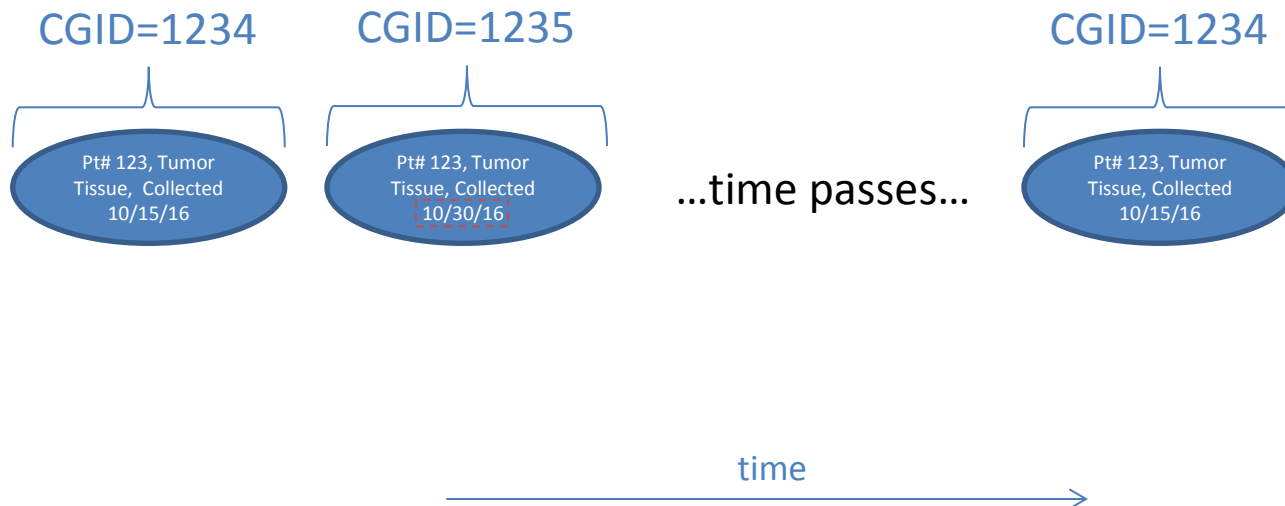
Collection Grouping Examples

- Scenario 1
 - First two specimens grouped together because attributes match (“equivalent” from PED-MATCH standpoint); New (shared) CGID
 - Third specimen was collected separately from first two; New CGID
 - Fourth specimen differs by type; New CGID



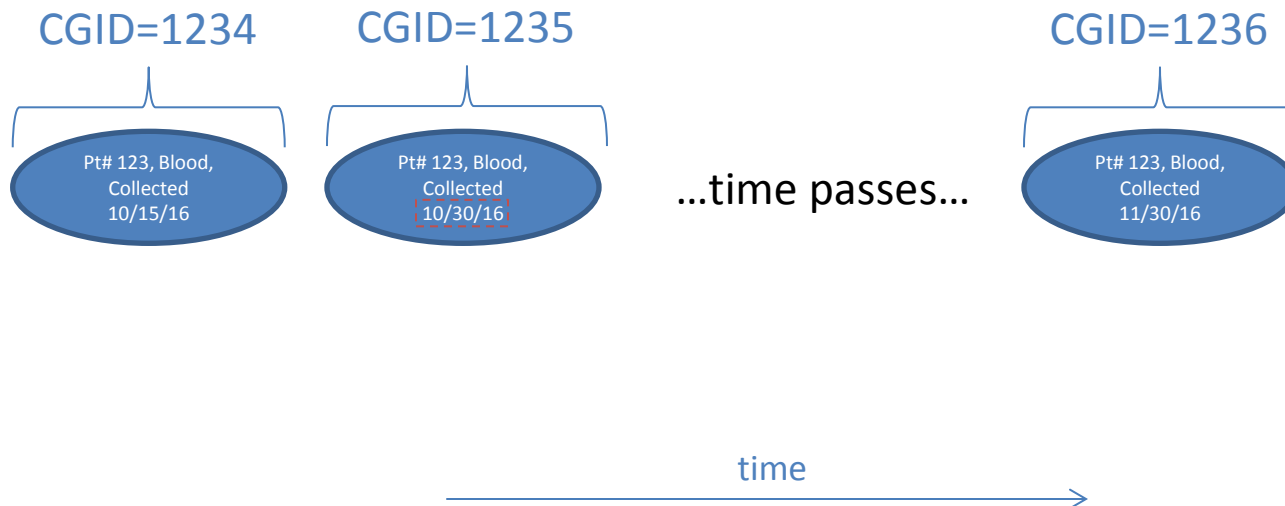
Collection Grouping Examples

- Scenario 2
 - First two specimens differ in collection date; Each receives a unique CGID
 - Third specimen—though arriving at the BPC days later—reuses the first specimen's CGID since they are “equivalent” from a PED-MATCH standpoint
 - Late-arriving specimens (e.g., delays in shipping/accessioning)
 - Cases where BPC requests additional portion of existing specimen (e.g., inadequacy) and site is able to indeed provide more from that original specimen



Collection Grouping Examples

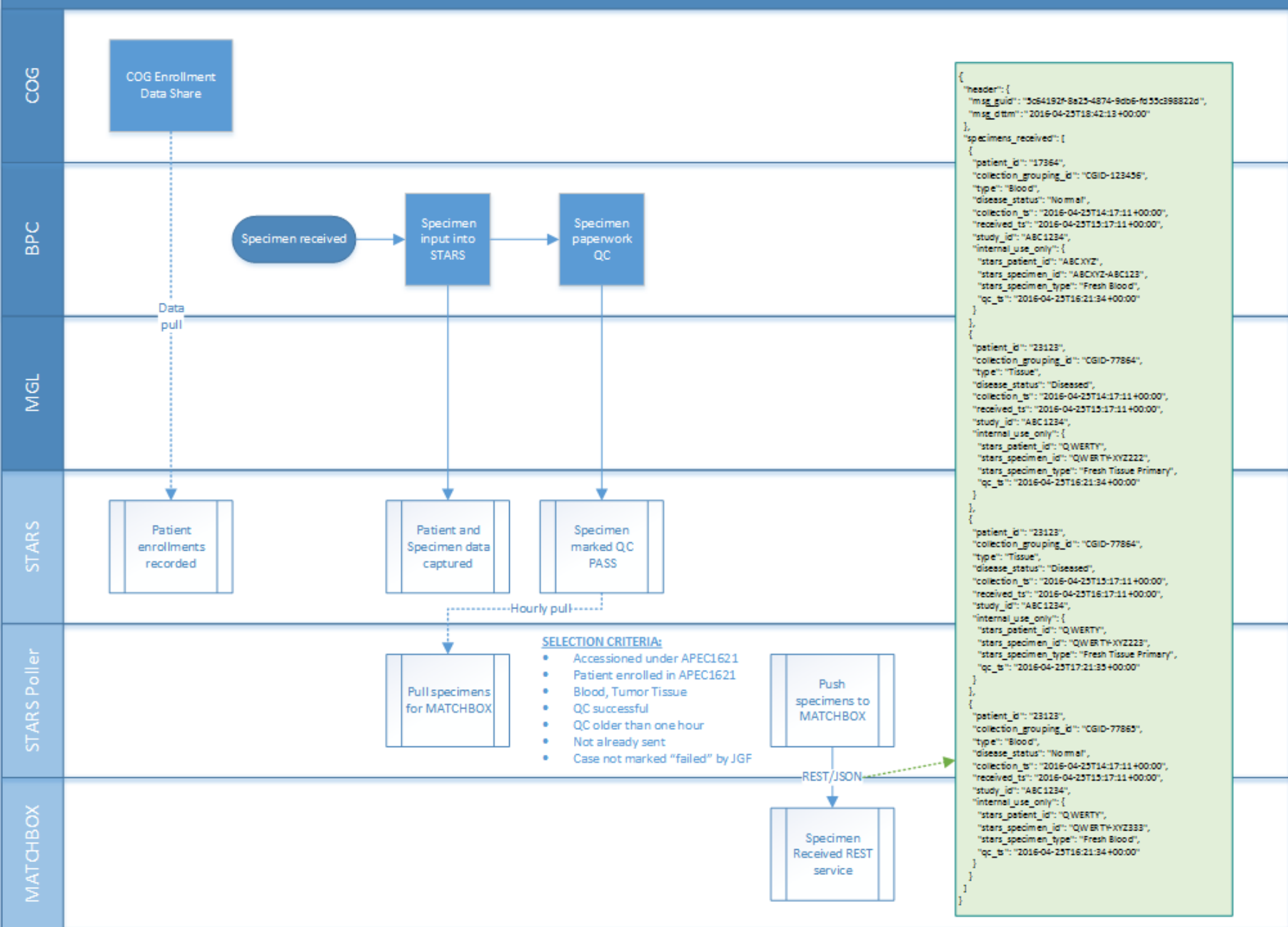
- Scenario 3
 - First two specimens differ in collection date; Each receives a unique CGID
 - Third specimen arrives at the BPC days later but does NOT reuse the first specimen's CGID since they are not from the same collection and thus not “equivalent” from a PED-MATCH standpoint
 - Cases where BPC requests additional portion of existing specimen (e.g., inadequacy) but site is unable to provide more of the original specimen, instead substituting from another specimen/draw/etc.



“Specimen Received” Integration Message

- **DIRECTION**: Outbound from BPC to MATCHBOX
- **TIMING**: Sent when new specimens of interest are detected in STARS
 - Specimen is accessioned under APEC1621
 - Patient is enrolled in APEC1621
 - Specimen type of Blood or Tumor Tissue
 - Accessioning paperwork QC is successful
- **CONTENT**:
 - Technical Message Headers (*msg_guid, msg_dttm*)
 - List of specimens
 - PED-MATCH attributes (*patient_id, collection_grouping_id, type, disease_status, study_id, received_ts, collection_ts*)
 - Additional (troubleshooting) attributes (*stars_patient_id, stars_specimen_id, stars_specimen_type, qc_ts*)
 - Timestamps conveyed in GMT/ISO-8601

BPC / PED-MATCH – Process and Integration Overview – Specimens Received (Success)



“Specimen Received” Integration Message

```
1 {
2   "header": {
3     "msg_guid": "5c64192f-8a25-4874-9db6-fd55c398822d",
4     "msg_dttm": "2016-04-25T18:42:13+00:00"
5   },
6   "specimens_received": [
7     {
8       "patient_id": "17364",
9       "collection_grouping_id": "CGID-123456",
10      "type": "Blood",
11      "disease_status": "Normal",
12      "collection_ts": "2016-04-25T14:17:11+00:00",
13      "received_ts": "2016-04-25T15:17:11+00:00",
14      "study_id": "ABC1234",
15      "internal_use_only": {
16        "stars_patient_id": "ABXYZ",
17        "stars_specimen_id": "ABXYZ-ABC123",
18        "stars_specimen_type": "Fresh Blood",
19        "qc_ts": "2016-04-25T16:21:34+00:00"
20      }
21    },
22    {
23      "patient_id": "23123",
24      "collection_grouping_id": "CGID-77864",
25      "type": "Tissue",
26      "disease_status": "Diseased",
27      "collection_ts": "2016-04-25T14:17:11+00:00",
28      "received_ts": "2016-04-25T15:17:11+00:00",
29      "study_id": "ABC1234",
30      "internal_use_only": {
31        "stars_patient_id": "QWERTY",
32        "stars_specimen_id": "QWERTY-XYZ222",
33        "stars_specimen_type": "Fresh Tissue Primary",
34        "qc_ts": "2016-04-25T16:21:34+00:00"
35      }
36    },
37    {
38      "patient_id": "23123",
39      "collection_grouping_id": "CGID-77864",
40      "type": "Tissue",
41      "disease_status": "Diseased",
42      "collection_ts": "2016-04-25T15:17:11+00:00",
43      "received_ts": "2016-04-25T16:17:11+00:00",
44      "study_id": "ABC1234",
45      "internal_use_only": {
46        "stars_patient_id": "QWERTY",
47        "stars_specimen_id": "QWERTY-XYZ223",
48        "stars_specimen_type": "Fresh Tissue Primary",
49        "qc_ts": "2016-04-25T17:21:35+00:00"
50      }
51    },
52    {
53      "patient_id": "23123",
54      "collection_grouping_id": "CGID-77865",
55      "type": "Blood",
56      "disease_status": "Normal",
57      "collection_ts": "2016-04-25T14:17:11+00:00",
58      "received_ts": "2016-04-25T15:17:11+00:00",
59      "study_id": "ABC1234",
60      "internal_use_only": {
```

```
object {2}
  header {2}
    msg_guid : 5c64192f-8a25-4874-9db6-fd55c398822d
    msg_dttm : 2016-04-25T18:42:13+00:00
  specimens_received [4]
    0 {8}
      patient_id : 17364
      collection_grouping_id : CGID-123456
      type : Blood
      disease_status : Normal
      collection_ts : 2016-04-25T14:17:11+00:00
      received_ts : 2016-04-25T15:17:11+00:00
      study_id : ABC1234
      internal_use_only {4}
        stars_patient_id : ABXYZ
        stars_specimen_id : ABXYZ-ABC123
        stars_specimen_type : Fresh Blood
        qc_ts : 2016-04-25T16:21:34+00:00
    1 {8}
    2 {8}
    3 {8}
      patient_id : 23123
      collection_grouping_id : CGID-77865
      type : Blood
      disease_status : Normal
      collection_ts : 2016-04-25T14:17:11+00:00
      received_ts : 2016-04-25T15:17:11+00:00
      study_id : ABC1234
      internal_use_only {4}
        stars_patient_id : QWERTY
        stars_specimen_id : QWERTY-XYZ333
        stars_specimen_type : Fresh Blood
        qc_ts : 2016-04-25T16:21:34+00:00
```


Terminology (continued)

- Workflow Exception
 - Something that does not follow the happy path
 - Does not necessarily imply failure—could be informative
 - May be a patient-level or specimen-level issue
- Workflow Exception Severity
 - “Advisement” = Correctable situation or status update
 - “Failure” = Non-correctable situation (with likely downside implications for patient’s involvement in Ped-MATCH)
- Workflow Exception Details
 - Will include a discrete “exception_reason” from a pre-defined list (e.g., “path_not_concordant”); semantics still being defined—future draft will propose
 - May include a free-form textual “exception_notes” with additional details to help understand the context of the exception (e.g., “Specimen appears to have been contaminated”)

“Workflow Exception” Integration Message

```
1 |
2 | "header": {
3 |   "msg_guid": "0391c030-8317-4cbb-82d2-40a091dd5768",
4 |   "msg_dttm": "2016-05-25T18:42:13+00:00"
5 | },
6 | "workflow_exceptions": [
7 |   {
8 |     "patient_id": "17364",
9 |     "collection_grouping_id": "CGID-123456",
10 |    "event_ts": "2016-04-25T14:17:11+00:00",
11 |    "exception_severity": "failure",
12 |    "exception_reason": "insufficient_material_available",
13 |    "exception_notes": "Qty of specimen inadequate; Site contacted but no further specimen
14 |      unavailable",
15 |    "exception_guid": "d4ef1e3b-0226-4fd6-90e7-aaac3fb6158",
16 |    "internal_use_only": {
17 |      "stars_event_id": 123456,
18 |      "stars_event_entered_by": "jgjf"
19 |    }
20 |  },
21 |   {
22 |     "patient_id": "2222",
23 |     "event_ts": "2016-04-25T14:17:11+00:00",
24 |     "exception_severity": "failure",
25 |     "exception_reason": "patient_not_enrolled_on_protocol",
26 |     "exception_notes": "COG data share does not indicate current patient enrollment in
27 |       AEPC1621",
28 |     "exception_guid": "500a2e62-fce2-45b1-a3fc-fe975e0f0930",
29 |     "internal_use_only": {
30 |
31 |     },
32 |   },
33 |   {
34 |     "patient_id": "4444",
35 |     "collection_grouping_id": "CGID-2222",
36 |     "event_ts": "2016-05-25T14:17:11+00:00",
37 |     "exception_severity": "advisement",
38 |     "exception_reason": "insufficient_material_available",
39 |     "exception_notes": "Qty of specimen inadequate; Site contacted 5/25; Awaiting additional
40 |       specimen",
41 |     "exception_guid": "08f63895-f3b2-4e2d-88ed-22cfff686f96",
42 |     "internal_use_only": {
43 |       "stars_event_id": 234567,
44 |       "stars_event_entered_by": "tabler01"
45 |     }
46 |   }
47 | ]
48 | }
```

```
object {2}
  header {2}
    msg_guid : 0391c030-8317-4cbb-82d2-40a091dd5768
    msg_dttm : 2016-05-25T18:42:13+00:00
  workflow_exceptions [3]
    0 {8}
      patient_id : 17364
      collection_grouping_id : CGID-123456
      event_ts : 2016-04-25T14:17:11+00:00
      exception_severity : failure
      exception_reason : insufficient_material_available
      exception_notes : Qty of specimen inadequate; Site contacted but no further
        specimen unavailable
      exception_guid : d4ef1e3b-0226-4fd6-90e7-aaac3fb6158
      internal_use_only {2}
        stars_event_id : 123456
        stars_event_entered_by : jgjf
    1 {7}
      patient_id : 2222
      event_ts : 2016-04-25T14:17:11+00:00
      exception_severity : failure
      exception_reason : patient_not_enrolled_on_protocol
      exception_notes : COG data share does not indicate current patient enrollment in
        AEPC1621
      exception_guid : 500a2e62-fce2-45b1-a3fc-fe975e0f0930
      internal_use_only {0}
        (empty object)
    2 {8}
      patient_id : 4444
      collection_grouping_id : CGID-2222
      event_ts : 2016-05-25T14:17:11+00:00
      exception_severity : advisement
      exception_reason : insufficient_material_available
      exception_notes : Qty of specimen inadequate; Site contacted 5/25; Awaiting
        additional specimen
      exception_guid : 08f63895-f3b2-4e2d-88ed-22cfff686f96
      internal_use_only {2}
        stars_event_id : 234567
        stars_event_entered_by : tabler01
```

(draft)

Workflow Exception/Advisement Scenarios

- Specimen Adequacy Advisements
 - Insufficient Material
 - Incorrect/Unexpected Material
 - Requesting additional material
 - No further material available
- Pathology Review Advisements
 - Pathology Not Concordant
 - Insufficient Tumor Present / High Necrosis
- Extraction Advisements
 - Low Yield / QNS
 - Extraction QC Failure
 - General Laboratory Failure (catch all, e.g., contaminated specimen)
- Patient Advisements
 - Patient Identity Mismatch
 - Patient Not Enrolled (based on enrollment data from COG data share)

To be continued...

- Definition of specific attributes for grouping specimens for CGID derivation
- Semantics and messaging scenarios for “specimen failed” messaging

Testing Screen Mock Ups

- ...scenarios for JGF...

GitHub Repo

- Public repository
- Read-only access to NCH design documents, sample messages, etc.
- Supports versions and branching
- <https://github.com/NCH-BPC-Informatics/pedmatch-arch-docs>

