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ASCO Quality Training Program

# ASCO Quality Training Program

## Improving Time to Molecular Testing Results in Patients with Newly Diagnosed, Metastatic Non-Small Cell Lung Cancer (NSCLC)

6/18/2021

# Institutional Overview

Kaiser Permanente Northern California: San Francisco

- We are part of an integrated network of 9000 physician practice, 130 oncologists, 21 cancer centers
- 4000 Employees
- 500 Physicians
- Hematology and Oncology
- Our department is part of the American College of Surgeon's Commission on Cancer (CoC) Accreditation Program.
- It is also a program of the National Institutes of Health and an NCORP program.

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# Team members

## Dr. Amy Lin
Medical Oncologist, Cancer Liaison Physician for COC

## Dr. Raymond Liu
Director of Research, Hematology – Oncology, Kaiser Permanente Northern California

## Dr. Elad Neeman
Hematology and Oncology Fellow, Second Year

## Dr. Stephanie Ossowski
Hematology and Oncology Fellow, Second Year

## Charles Borden
Director, Quality and Patient Safety Cancer Institute Hartford HealthCare

# Team members

## Additional Contributors:

**Lucy Giraldo**
Pathology PA

**Kiranjit Grewal**
Regional Pathology director

**Dr. Scott Tomlins**
STRATA Chief Medical Officer

**Dr. Jed Katzel**
Medical oncologist, subspecializing in lung cancer

**Dr. Marie Suga**
Medical oncologist, subspecializing in lung cancer

**Dr. Laurel Habel**
Director of the Division of Research (DOR)

**Elaine Chung**
DOR Project lead STRATA

**Chen Jiang**
DOR STRATA

**Pamela Tse**
STRATA site coordinator

# Problem Statement

Currently there are delays from diagnosis to next generation sequencing (NGS) results in patients with metastatic non-small cell lung cancer (NSCLC). At our institution, it takes a median of 24 days for patients with a pathological diagnosis to receive results of NGS, compared to 15 days recommended by ASCO and 10 days seen in the MYLUNG Consortium study. Specifically, delays in NGS results can lead to

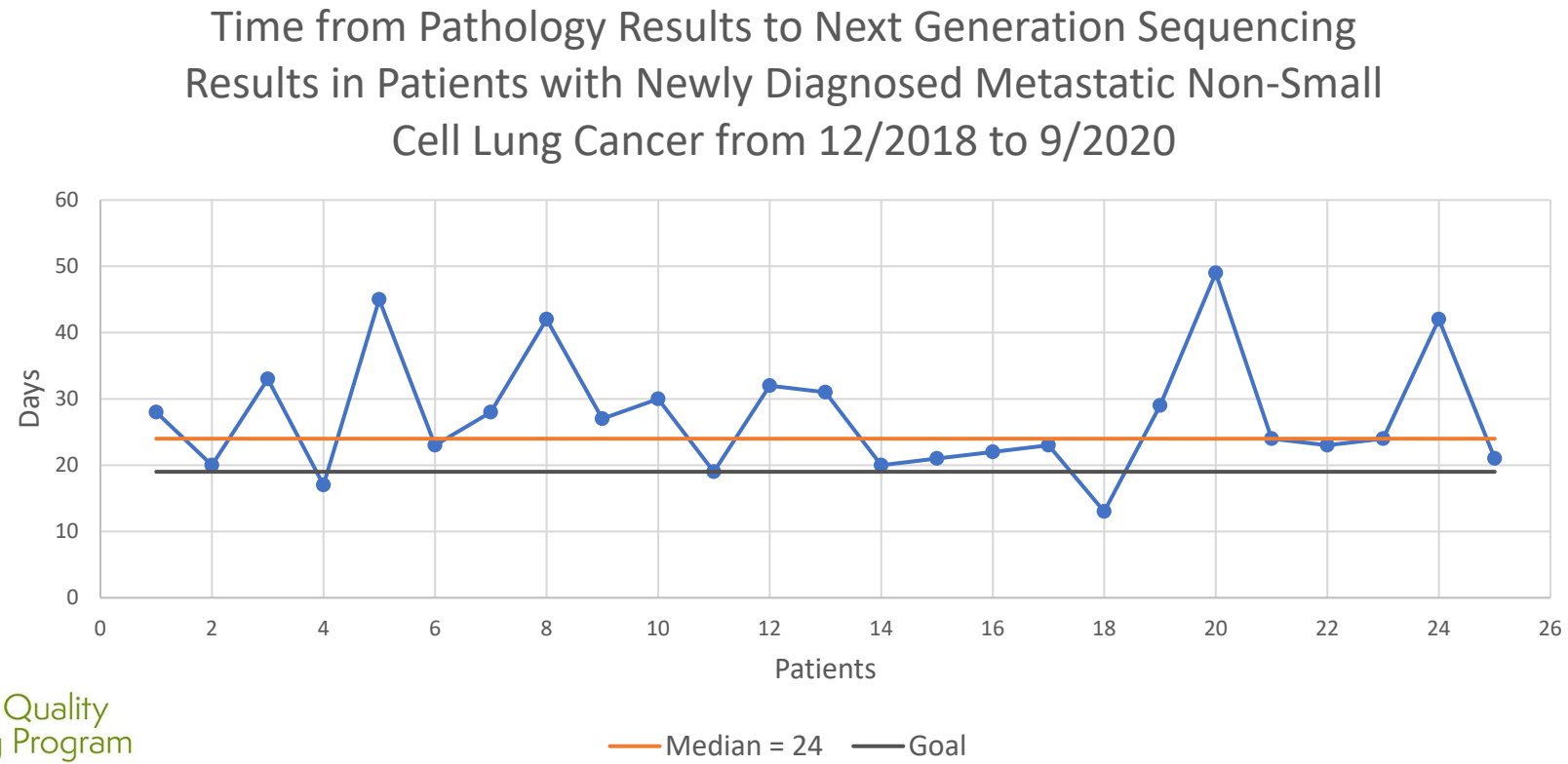
- Increased patient fear and anxiety
- Inappropriate use of front-line therapies
- Increased mortality

*Outcome Measure*

# Baseline data summary

| Item | Description |
|---|---|
| Measure: | Time from pathological diagnosis to NGS results |
| Patient population:<br>*(Exclusions, if any)* | Untreated, newly diagnosed patients with stage IV NSCLC |
| Calculation methodology:<br>*(i.e. numerator & denominator)* | Median number of days to NGS results for patients with newly diagnosed metastatic NSCLC. |
| Data source: | EMR Chart review of dates regarding time to treatment |
| Data collection frequency: | 26 patients with newly diagnosed NSCLC were reviewed from 12/2018 to 9/2020. |
| Data limitations:<br>*(if applicable)* | One patient diagnosed with simultaneous glioblastoma and metastatic NSCLC, excluded from preliminary data set. |

# *Outcome Measure*
# Baseline data

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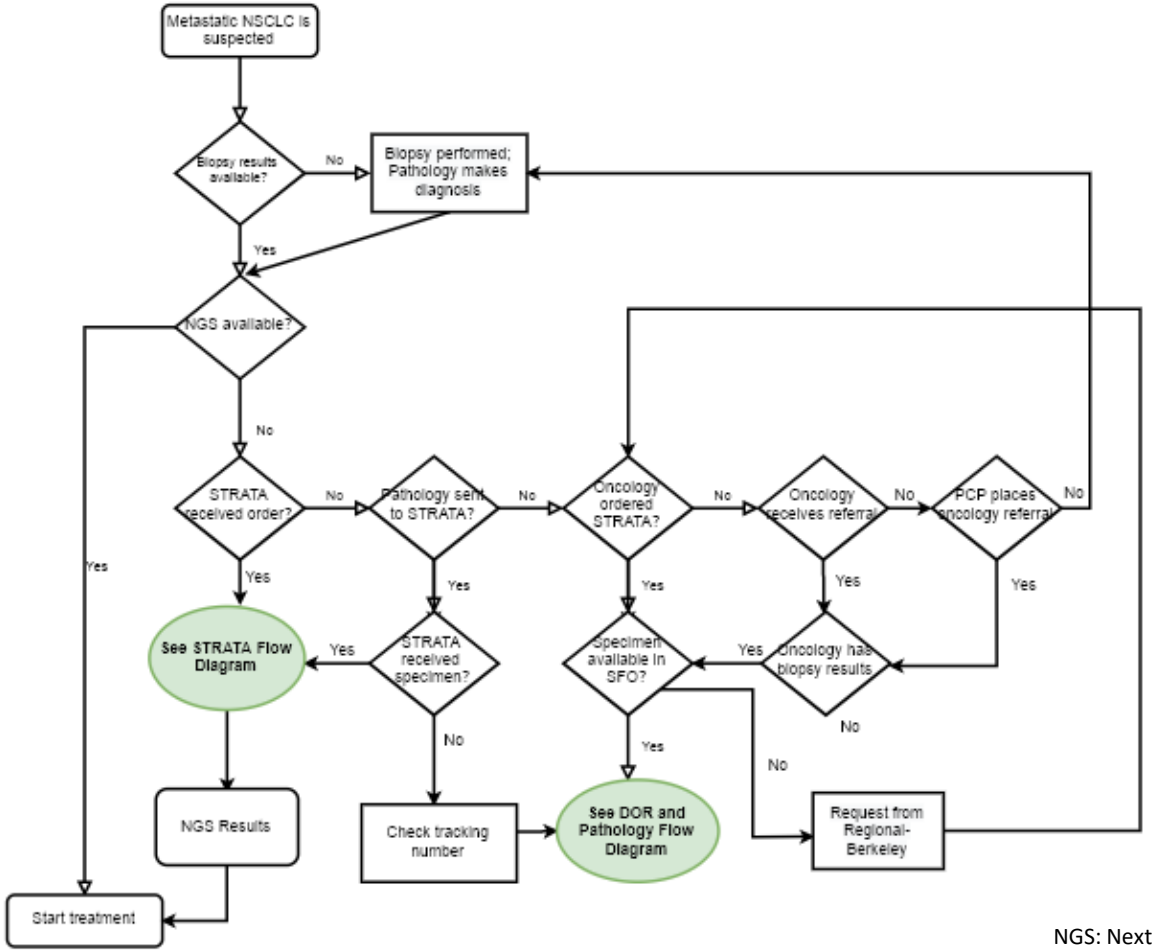
# Aim Statement

By June 1, 2021, we aim to reduce time from pathological diagnosis to NGS results for newly diagnosed patients with metastatic non-small cell lung cancer by 5 days, reducing time to NGS results to 19 days.

# Process Map

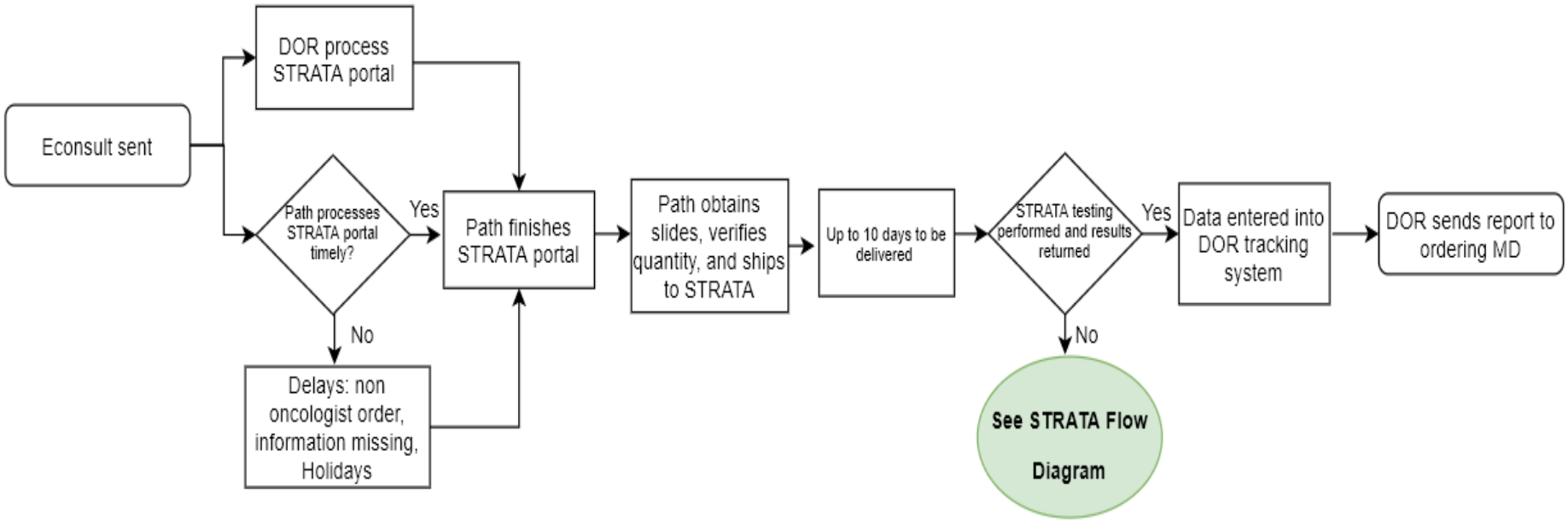
- Steps in the Process
  - Oncology
  - Pathology
  - Division of Research
  - STRATA (NGS vendor)
- Number of Handoffs: 8
- Surprises: NGS process could be more efficient. Timing of sample delivery to NGS vendor effects process most. Inefficiency also stems from frequent handoffs of data.

# Time to Next Generation Sequencing Results Flow Diagram



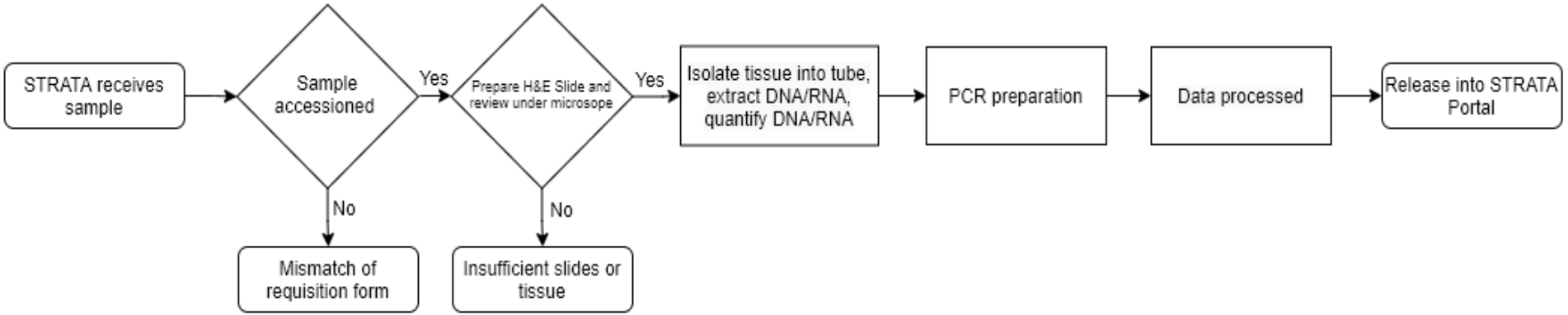

NGS: Next generation sequencing
STRATA: Next generation sequencing company

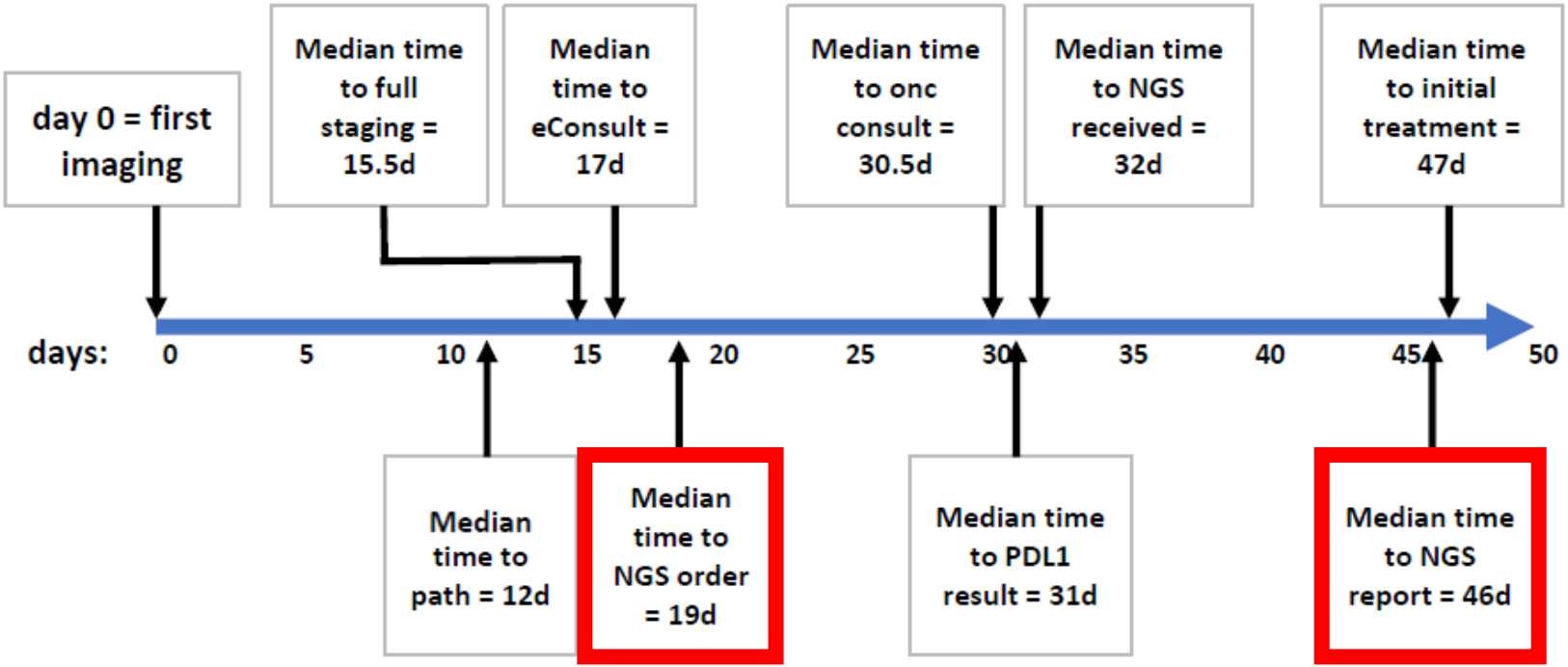
# Pathology and Division of Research Flow Diagram



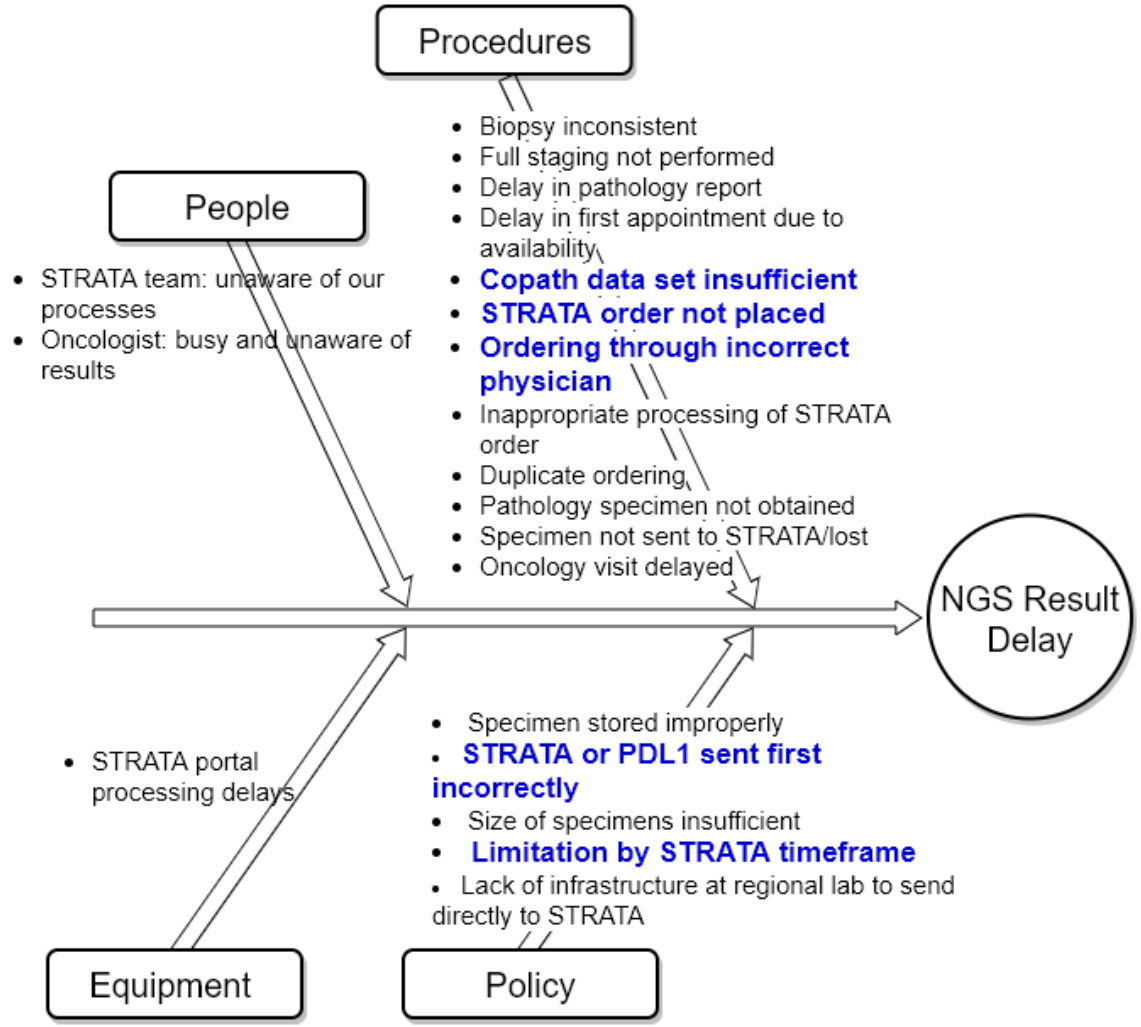

DOR: Division of Research
STRATA: Next generation sequencing company

# STRATA Flow Diagram



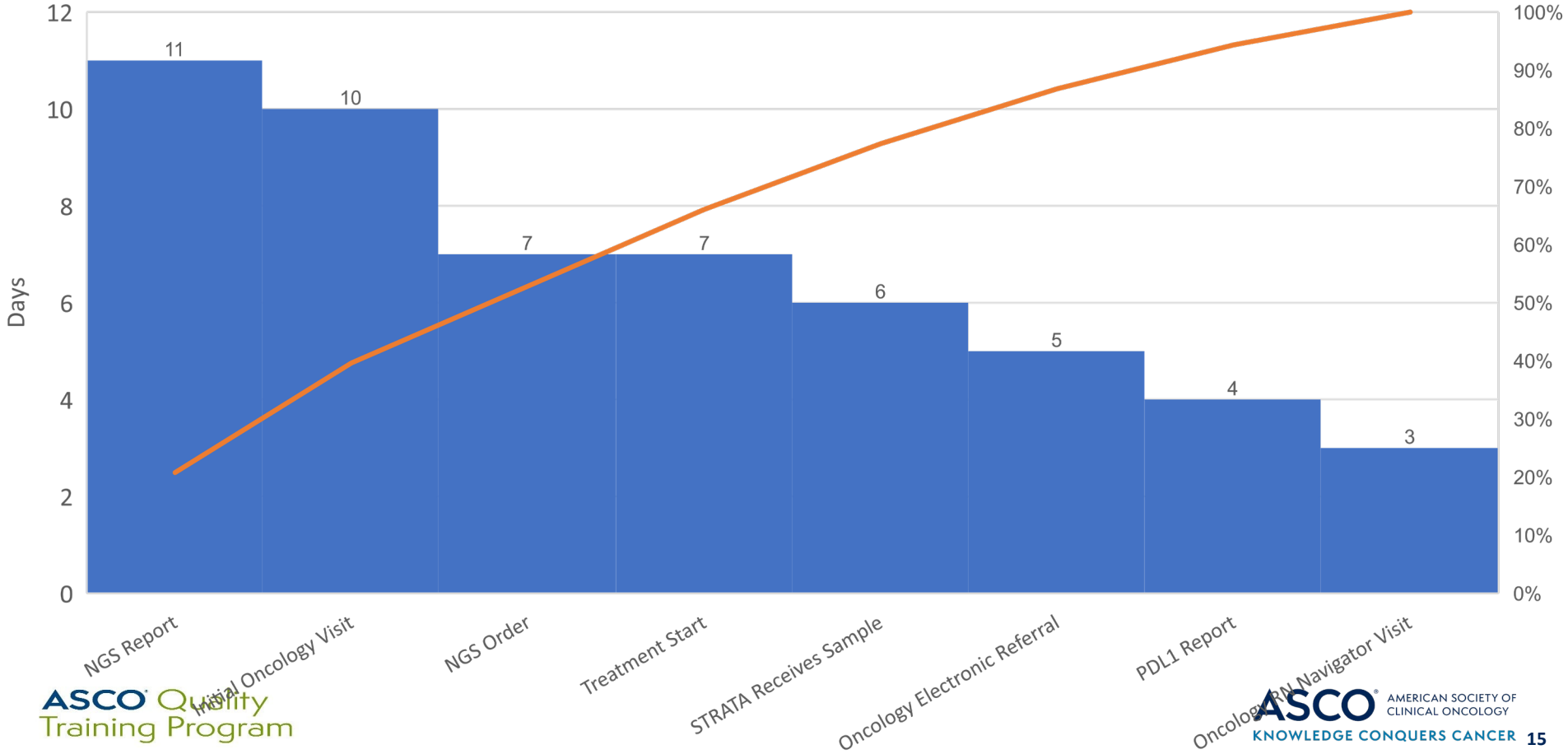



NGS: Next generation sequencing


Procedures
Biopsy inconsistent
Full staging not performed
Delay in pathology report
Delay in first appointment due to availability
Copath data set insufficient
STRATA order not placed
Ordering through incorrect physician
Inappropriate processing of STRATA order
Duplicate ordering
Pathology specimen not obtained
Specimen not sent to STRATA/lost
Oncology visit delayed
People
STRATA team: unaware of our processes
Oncologist: busy and unaware of results
NGS Result Delay
Specimen stored improperly
STRATA or PDL1 sent first incorrectly
Size of specimens insufficient
Limitation by STRATA timeframe
Lack of infrastructure at regional lab to send directly to STRATA
STRATA portal processing delays
Equipment
Policy

# *Process Measure:* Diagnostic Data

**Median Time from Pathological Diagnosis to NGS Results in Patients with Newly Diagnosed Metastatic NSCLC from 12/2018 to 9/2020**



# *Priority / Pay-off Matrix*
# Countermeasures

| Impact | Ease of Implementation: Easy | Ease of Implementation: Difficult |
|---|---|---|
| High | • **Copath automated report sent to oncology.**<br>• **Change regional econsult to include ordering oncologist and prioritization of STRATA over PDL1.**<br>• **Allow specimens to be accepted at STRATA Monday-Sunday**<br>• **IR to take additional core biopsies from patients suspected to have mNSCLC.** | • **Centralization of STRATA process to exclude local pathology.**<br>• **Pilot centralization of process for SFO Oncology first.** |
| Low | • Modify local econsult page to include ordering oncologist and prioritize STRATA over PDL1.<br>• Provide education to oncology and pathology departments to prioritize STRATA over PDL1. | • Changing econsult order to HealthConnect order.<br>• Send pathology block to STRATA. |

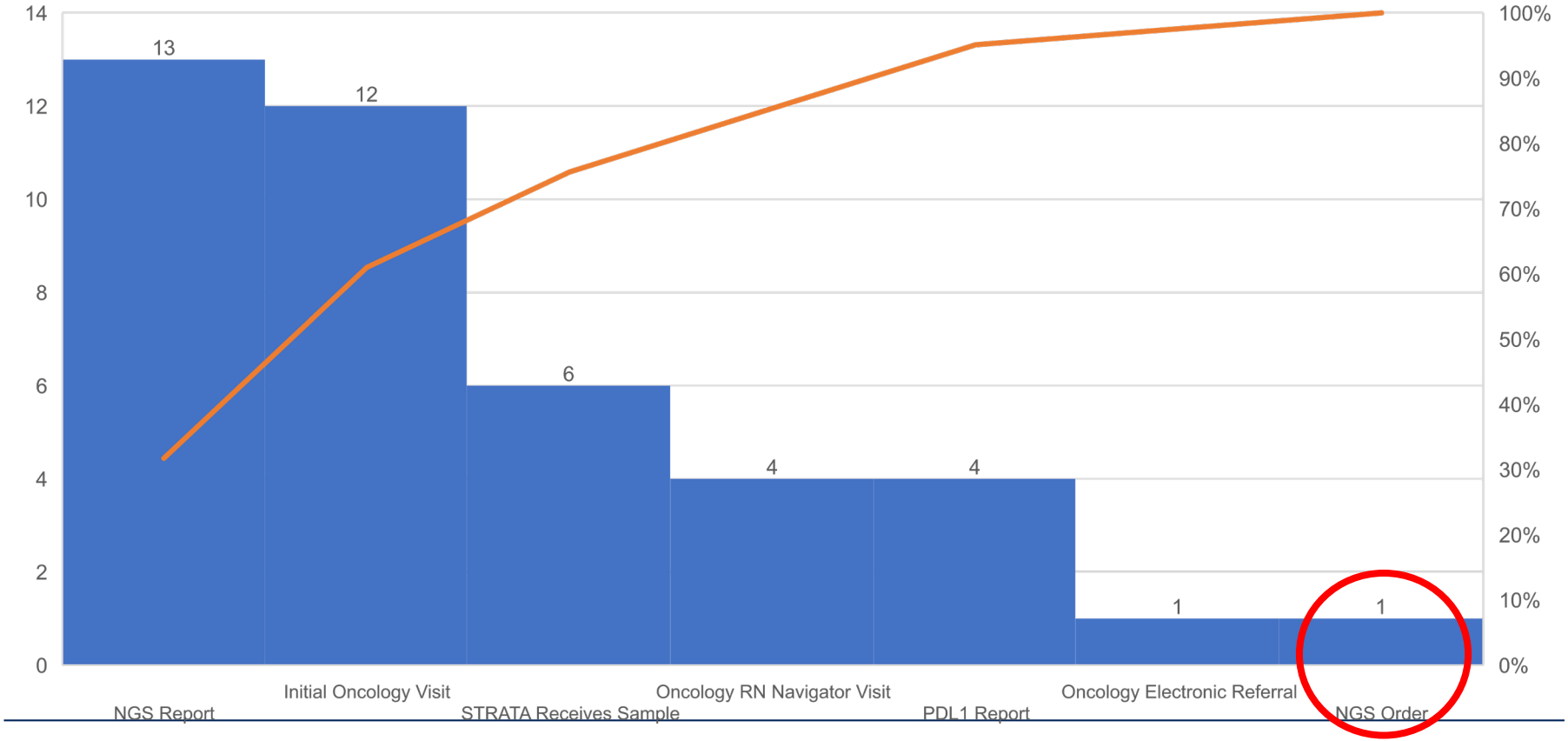
# *Process Measure*
# Diagnostic Data summary

| Item | Description |
|---|---|
| Measure: | Time from pathological diagnosis to NGS results |
| Patient population:<br>*(Exclusions, if any)* | Untreated, newly diagnosed patients with stage IV NSCLC |
| Calculation methodology:<br>*(i.e. numerator & denominator)* | Median number of days to NGS results for patients with newly diagnosed metastatic NSCLC. |
| Data source: | EMR Chart review of dates regarding time to treatment |
| Data collection frequency: | 11 patients with newly diagnosed NSCLC were reviewed from 11/2020 to 5/2021. |
| Data limitations:<br>*(if applicable)* | Exclusion: patients who only received liquid NGS testing only; patients diagnosed through atypical means. |

# *Test of Change*
# PDSA Plan

| Cycle | Date | PDSA Description | Result |
|---|---|---|---|
| 1 | 11/12/2020 | Interventional radiology began identifying (via econsult) suspected metastatic disease and obtaining additional tissue samples to allow for adequate tissue to be sent to STRATA and potentially allow for earlier next generation sequencing orders with the early identification of metastatic disease. | N= 11<br>Median 19 days |
| 2 | 11/20/2020 | Copath, a division of the pathology department, generated weekly, automated reports to the oncology department. Oncology department determined newly diagnosed metastatic NSCLC patients and placed next generation sequencing orders. | Prospective cohort, n=11<br>Reduction in time from biopsy results to NGS results by 5 days. Reduction in time from biopsy results to NGS order by 6 days. |

# Median Time from Pathological Diagnosis to NGS Results in Patients with Newly Diagnosed Metastatic NSCLC from 11/2020 to 5/2021

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# *Test of Change*
# PDSA Plan

| Cycle | Date | PDSA Description | Result |
|---|---|---|---|
| 3 | 1/2021 | Education to the pathology and oncology departments to prioritize STRATA over PDL1 | Not all patients had prioritization of STRATA over PDL1 with education alone, but PDSA cycle 4 aimed to achieve this same goal. |
| 4 | 5/2021 | E-consult updated to simply ordering of tissue NGS for physicians. Prioritization of STRATA over PDL1 explicitly stated. | Solidified implementation of prioritization of STRATA over PDL1. |
| 5 | 5/2021 | New Tissue NGS order integrated into Epic. | Caused unexpected delays as the division of research was unable to appropriately pull information needed to process each STRATA order. |

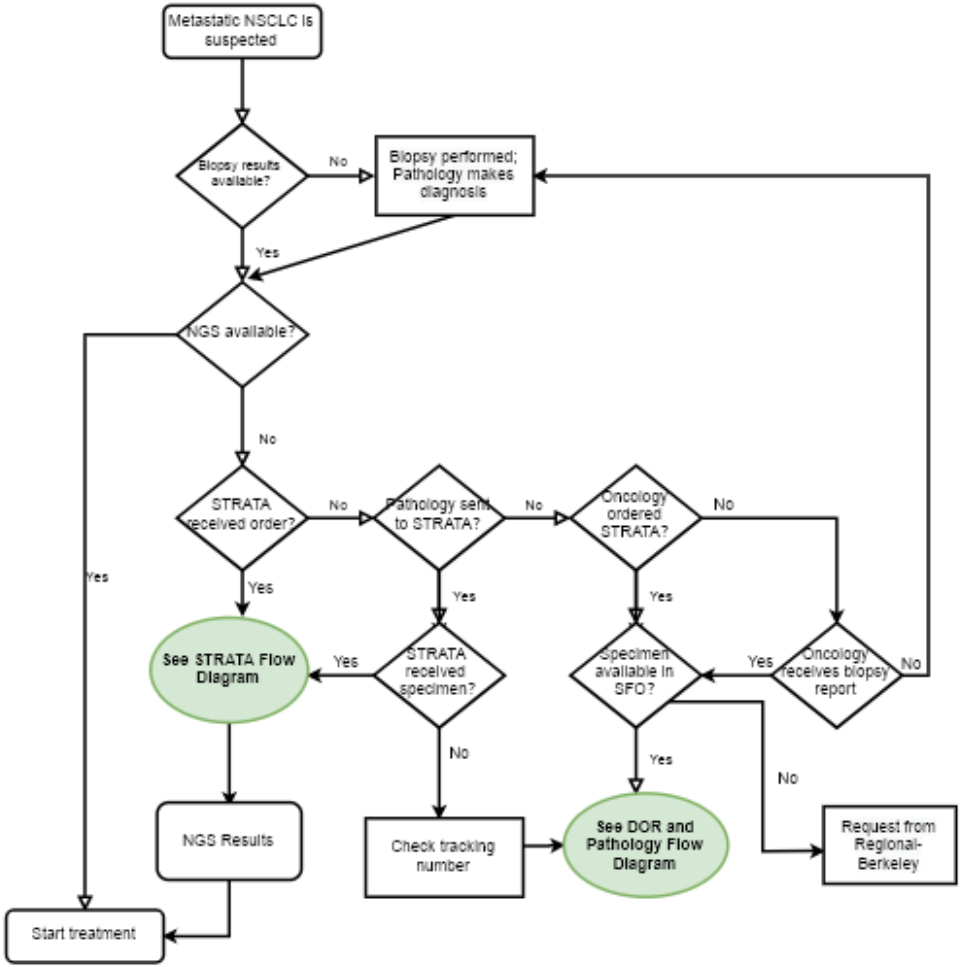
# Balancing Measures

- Ordering PDL-1 before tissue NGS can cause delays to specimens' transport to our NGS company.
- Implementing a new EMR order for tissue NGS can cause delays to department processing of this order.
- We are still collating data for these balancing measures.

# *Test of Change*
# Future PDSA Plans

| Cycle | Date | PDSA Description | Result |
|---|---|---|---|
| 6 | 7/2021 | STRATA accepting specimens every day. | This will allow pathology to send specimens out on Thursdays and Fridays and avoid 2-4 days delay due to weekend and holiday delays. |
| 7 | 9/2021 | Regionalization of pathology sending specimen directly to STRATA | This will reduce time to NGS results by 1-2 days, by eliminating a handoff between local and regional pathology las. |

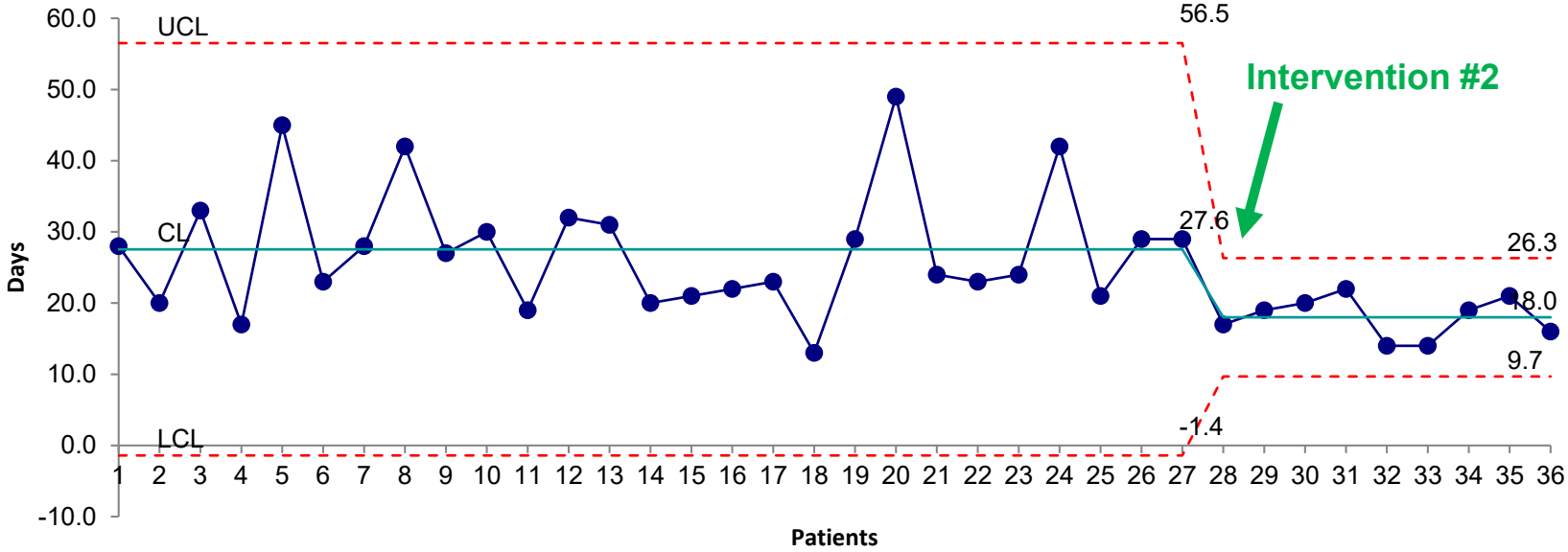
# Post Intervention: Time to Next Generation Sequencing Results Flow Diagram




lext generation sequencing
A: Next generation sequencing company

# *Outcome Measure:* Change Data

## Time from Pathology Results to Next Generation Sequencing Results in Patients with Newly Diagnosed Metastatic Non-Small Cell Lung Cancer from 12/2018 to 5/2021




Pre intervention average = 28 days; Post intervention average = 18 days

# *Next steps*
# Sustainability Plan

| Next Steps | Owner |
|---|---|
| RN Manager review copath report weekly and check in with fellows monthly. | Fellow and RN |
| Fellow will monitor process and outcome measures weekly. | Fellow |
| | |
| | |
| | |

# Conclusion and Lessons Learned

- Improved interdepartmental communication allowed for increased efficiency.
- Using technology to automate processes reduced turn around time.
- Parallel processing, when possible, can lead to expedited, improved outcomes.
- Inviting key stakeholders to the table was critical and possible!

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1 Kaiser Permanente Northern California, San Francisco, 2 Cancer Institute Hartford HealthCare

Kaiser Permanente Northern California

# Improving Time to Molecular Testing Results in Patients with Newly Diagnosed, Metastatic Non-Small Cell Lung Cancer (NSCLC)

**AIM: By June 1, 2021, we aim to reduce time from pathological diagnosis to NGS results for newly diagnosed patients with metastatic non-small cell lung cancer by 5 days, reducing time to NGS results to 19 days.**

**INTERVENTION: We reviewed process maps for oncology, pathology, the internal data management division, and a genomic testing company to determine factors leading to significant preventable delays. Since 11/2020, we created an automated weekly report using CoPath to identify new pathological diagnoses of potential metastatic NSCLC. The oncology department reviewed these cases weekly and NGS orders were placed for patients with metastatic NSCLC.**

**TEAM:**

- Oncology Department
- Pathology Department
- Internal Data Management Division
- NGS Vendor

**PROJECT SPONSORS:**

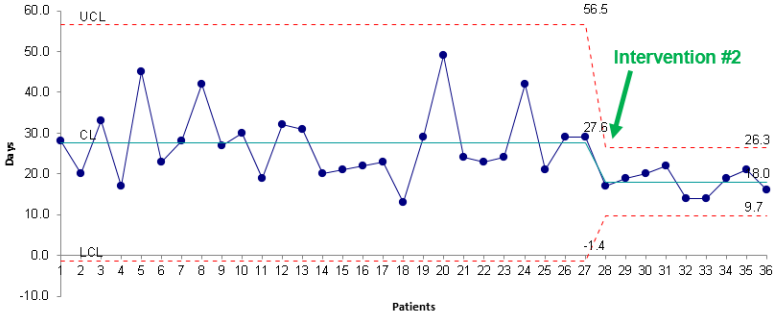
This work was supported by the Kaiser Permanente Northern California Graduate Medical Education Program, Kaiser Foundation Hospitals

## RESULTS:

Table 1. Demographics

| Cohort | Historical N=25 | Prospective N=11 |
|---|---|---|
| Age (median) | 68 | 76 |
| Male | 72% | 42% |
| Smoking status | | |
| Former smoker | 64% | 67% |
| Current smoker | 4% | 0% |
| Never smoker | 32% | 33% |
| Actionable Mutation | 48% | 50% |
| PDL-1 TPS ≥50% | 8% | 33% |
| PDL-1 TPS ≥1-49% | 36% | 50% |
| PDL-1 TPS <1% | 36% | 8% |
| PDL-1 TPS not tested | 20% | 8% |

**Time from Pathology Results to Next Generation Sequencing Results in Patients with Newly Diagnosed Metastatic Non-Small Cell Lung Cancer from 12/2018 to 5/2021**




**CONCLUSIONS: Delays in time to NGS results can be reduced by improved communication between departments and simple, automated interventions to ensure results are efficiently released to an oncologist.**

**NEXT STEPS: Additional Plan-Do-Study-Act cycles are currently being developed to further reduce time from biopsy results to NGS results.**

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