



NATIONAL
LUNG CANCER
ROUNDTABLE

LUNG CANCER SCREENING / NODULE MANAGEMENT

An Approach to Financial Modeling and Forecasting



USER MANUAL

Version 1.0

*Make financial forecasts with **LungPLAN**
Projecting Lung Assessment Needs*

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Download and Enable the LungPLAN Model

Follow the instructions below to download and enable the LungPLAN financial modeling tool.

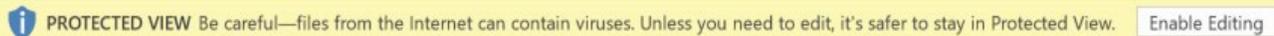
Download LungPLAN

Download the model from <https://nlcrt.org/lungplan-overview/>.

Find the instructions to *Access the LungPLAN Model*. You will be asked to complete a short survey before you are able to download the model. After the survey is completed, a link will appear. Follow the download instructions to receive your LungPLAN model. Save the LungPLAN model to a separate folder on your device.

Enable the LungPLAN Model

The LungPLAN model uses embedded macros to model the financial impact of lung cancer screens and incidentally detected nodules. Typically, Excel will display a “Protected View” warning message at the top of the Introduction tab the first time it opens the model on your computer.



Follow the steps below to remove the warning message.

- Click the “Enable Editing” button.
- Save the file to your LungPLAN folder.
- Close the file.
- Open the file again. The warning message should not appear.

Enable Macros in Excel (Windows only)

The LungPLAN model uses internal code macros to model the workflows for your organization. The macros must be enabled by following the steps below (Windows only):

- Open Microsoft Excel (with or without the LungPLAN model loaded).
- Click menu File, Options (bottom left), Trust Center (last menu item).
- Click Trust Center Settings (button on the right).
- In the menu box that appears, select Macro Settings (middle of the list).
- Click “Enable VBA Macros.”
- Close Excel to save the settings – you are done! You will not need to do this again.

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How to Use This LungPLAN Model

Welcome to the **LungPLAN** financial modeling tool! This tool will help you identify the financial value of a new or existing lung cancer screening program and determine the overall financial value of identifying incidentally detected lung nodules at your organization.

Input Requirements

As you use the **LungPLAN** model, you will become more familiar with the different input requirements and understand the clinical workflows and financial value as patients follow the Lung Cancer Screening Workflow and the Incidentally Detected Lung Nodule Patient Workflow. The primary inputs on the Dashboard tab are as follows:

- New patients entering the screening program in Year 1
- Institutional chest CT scans done (outside of the screening program)

Within the model, there are many clinical and financial variables to consider as you model lung cancer screening and chest CT scan volumes. These different variables can be seen on the Dashboard and the Baseline Metrics tabs. These different adjustments will help you to customize the financial model for your organization.

Investment Costs to Support Your Programs

To ensure success in your programs, your organization may need to make investments in different areas to capture the clinical and financial results. For example, additional nurse navigators, or other clinical staff may need to be hired to support the programs. Additionally, your organization may need to make a software investment to ensure all patients are monitored and followed throughout their lung cancer or lung nodule journey.

Communicating the Clinical and Financial Results

Finally, once you are satisfied with the modeling results completed for your organization, the Output tab provides a documented clinical and financial summary to assist in communicating the results of your analysis. Different inputs and variables can be easily updated based on organization financial and clinical metrics, representing the most current information at your organization.

Final Comments

The American Cancer Society (ACS) and the National Lung Cancer Roundtable (NLCRT) are willing to assist you, provide additional insights about how to use the **LungPLAN** model, and create resources

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to support your modeling success. They can help you to understand the clinical and financial value of increasing the number of lung cancer screens and identify additional lung nodules through institutional chest CT scans at your organization.

Good Luck!

Dashboard Tab – Volume Information

The Dashboard tab provides a summary of the clinical and financial modeling information for your organization over a 5-year period. On this tab, you enter:

Volume Information

- The number of lung cancer screening patients in Year 1
- The number of Institutional chest CT scans (outside of a lung screening program) in Year 1
- Potential growth rate, by year, for both lung cancer screening volume and chest CT scans

Patient Volumes						
<input checked="" type="checkbox"/> LUNG CANCER SCREENING	Year 1	Year 2	Year 3	Year 4	Year 5	
New Patients Entering Lung Cancer Screening Program EACH YEAR 	500	50	83	127	190	
Annual growth rate of new patients (%)		10%	15%	20%	25%	Total Eligible Patients
Total Patients Eligible for New Screens & Ongoing Treatment	500	550	633	760	950	3,393
<input checked="" type="checkbox"/> INCIDENTALLY DETECTED LUNG NODULES	Year 1	Year 2	Year 3	Year 4	Year 5	
Institutional Chest CT Scans (outside of Lung Cancer Screening program) 	5,000	50	51	51	52	
Annual growth rate of Institutional Chest CT Scans (%)		1%	1%	1%	1%	Total Chest CT Scans
Total Chest CT Scans each Year	5,000	5,050	5,101	5,152	5,204	25,507

Adjusting the different volumes for each workflow allows the organization to customize the potential growth. This is important, especially for a lung cancer screening program, as it will show organization efforts to increase volume through marketing campaigns, smoking cessation programs, or any effort to increase the number of lung cancer screens for an organization.

Organization Adjustments

There are many important variable adjustments to consider when customizing the **LungPLAN** model to your organization. Some of these variables include:

- Facility Type: Network/Stand-alone/FQHC/VA/Other
- Cancer Incidence Rate in your area: High/Average/Low
- Nurse Navigator Impact to Fall-out Rate: High/Average/Low
- Payer Distribution at your organization: Commercial, Medicare, Medicaid, Self-Pay & Other
- Baseline Metrics: Use current defaults or adjust metrics as needed for your organization.

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Once these variables are adjusted, the financial output will calculate the financial benefits based on your customized modeling scenarios.

Organization Name and Important Variables						
Organization Name	Your Organization Name Here					
Facility Type (Network/Academic/Stand-alone/FQHC/VA/other)	Network	All downstream revenue options are included by default (customization available).				
Cancer Incidence Rate (High / Average / Low)	AVERAGE	No adjustments needed to patients identified as "Diagnostic Pathway" or "Interval F/U" for Lung Cancer				
Navigator Impact to the Fall-out Rate (High/Average/Low)	AVERAGE	No adjustments needed to patient "Fall-out" rate (i.e., average Navigator effectiveness)				
Payer Distribution at your Organization ⁸	All years for every patient type	Commercial	Medicare	Medicaid	Self-pay/Other	Total
		33%	41%	19%	7%	100%
Baseline Metrics	Click on this button to view/edit baseline metric assumptions used in this model >					Click to Unhide "Baseline Metrics" tab

Dashboard Tab – Lung Cancer Financial Value

Financial Value

Based on the lung cancer screening volume for years 1-5 and the incidentally detected lung nodule volume for years 1-5, the overall financial value for each section can be seen in the Total Financial Value Table. The table is generated by calculating the volumes and the financial value assigned to each workflow category.

Lung Cancer Financial Value

Based on the lung cancer screening volume for years 1-5, these screened patients will follow a clinical workflow and fall into the following categories:

- Lung cancer screening reimbursement by year
- Diagnostic evaluation reimbursement by year
- Stage 1 – 4 downstream treatment revenue by year
- Actionable significant finding (ASF) treatment revenue by year

The following Total Financial Value Table calculates the financial value over a 5-year period, all based on the lung cancer screening volume and financial value associated with screening reimbursement, diagnostic evaluation reimbursement, potential downstream revenue for Stages 1-4 for all five years, and the actionable significant finding (ASF) treatment revenue.

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Total Financial Value						
<input checked="" type="checkbox"/> Lung Cancer Screening Program - Financial Value	Year 1	Year 2	Year 3	Year 4	Year 5	Total
<input checked="" type="checkbox"/> Lung Cancer Screening Reimbursement ⓘ	\$38,800	\$36,800	\$37,700	\$41,800	\$50,300	\$205,400
<input checked="" type="checkbox"/> Diagnostic Evaluation Reimbursement ⓘ	\$62,700	\$4,500	\$9,000	\$15,700	\$22,400	\$114,300
<input checked="" type="checkbox"/> Stage 1: Downstream Treatment Revenue ⓘ	\$79,400	\$79,400	\$79,400	\$79,400	\$79,400	\$397,000
<input checked="" type="checkbox"/> Stage 2: Downstream Treatment Revenue	\$52,000	\$26,000	\$13,000	\$6,500	\$55,300	\$152,800
<input checked="" type="checkbox"/> Stage 3: Downstream Treatment Revenue	\$78,500	\$39,200	\$19,600	\$9,800	\$4,900	\$152,000
<input checked="" type="checkbox"/> Stage 4: Downstream Treatment Revenue	\$348,000	\$174,000	\$87,000	\$159,500	\$195,700	\$964,200
<input checked="" type="checkbox"/> ASF Treatment Revenue ⓘ	\$109,000	\$10,900	\$16,300	\$27,200	\$43,600	\$207,000
TOTAL	\$768,400	\$370,800	\$262,000	\$339,900	\$451,600	\$2,192,700

Financial Value Overview

Reviewing the financial value modeled over the 5-year period allows the organization to better understand the total financial value of a lung cancer screening program in each impact area. All financial value is determined by the lung cancer screening volume per year following the clinical workflow and placement of these patients throughout the 5-year period.

The total financial value of each patient is determined by the reimbursement assigned to each lung cancer screen, the reimbursement generated from a diagnostic evaluation if the patient is placed in this category, and the potential downstream revenue if a patient does have cancer and suggested treatment diagnosis. Finally, any actionable significant finding (ASF) patient identified through a lung cancer screen has associated treatment revenue modeled over the 5-year period.

Dashboard Tab – Lung Nodule Financial Value

Incidentally Detected Lung Nodules Financial Value

Similarly, the total financial value identified for incidentally detected lung nodules is modeled over the 5-year period. These patients will fall into the following categories:

- Diagnostic Chest CT reimbursement by year
- Diagnostic evaluation reimbursement by year
- Stage 1 – 4 downstream treatment revenue by year

The Total Financial Value Table below shows the financial value over a 5-year period, all based on the incidentally detected lung nodule patients identified through institutional chest CT scans performed at the organization throughout the year. A percentage of these chest CT scans will identify a subset of patients that may have lung cancer. The table shows the lung nodule volume and financial value associated with screening reimbursement, diagnostic evaluation reimbursement, and potential downstream revenue for Stages 1-4 for all five years.

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<input checked="" type="checkbox"/> Incidentally Detected Lung Nodules - Financial Value	Year 1	Year 2	Year 3	Year 4	Year 5	Total
<input checked="" type="checkbox"/> Lung Cancer Screening Reimbursement ⓘ	\$39,100	\$72,700	\$101,900	\$127,000	\$148,500	\$489,200
<input checked="" type="checkbox"/> Diagnostic Evaluation Reimbursement ⓘ	\$112,000	\$112,000	\$114,200	\$114,200	\$116,400	\$568,800
<input checked="" type="checkbox"/> Stage 1: Downstream Treatment Revenue ⓘ	\$39,700	\$99,300	\$129,100	\$144,000	\$111,700	\$523,800
<input checked="" type="checkbox"/> Stage 2: Downstream Treatment Revenue	\$0	\$0	\$0	\$0	\$52,000	\$52,000
<input checked="" type="checkbox"/> Stage 3: Downstream Treatment Revenue	\$78,500	\$39,200	\$19,600	\$9,800	\$4,900	\$152,000
<input checked="" type="checkbox"/> Stage 4: Downstream Treatment Revenue	\$116,000	\$174,000	\$203,000	\$217,500	\$224,700	\$935,200
TOTAL	\$385,300	\$497,200	\$567,800	\$612,500	\$658,200	\$2,721,000

Financial Value Overview

Reviewing the total financial value modeled over the 5-year period enables your organization to better understand the financial value of identifying incidentally detected lung nodules using chest CT scans. The financial value is determined by modeling the incidentally detected lung nodule volume per year and the clinical workflow and placement of those patients throughout a 5-year period. The clinical workflow of the nodule patients follows the workflow of a lung cancer screening patient.

The total financial value of each patient is calculated from the reimbursement of a diagnostic chest CT scan, the reimbursement from a diagnostic evaluation if the patient requires evaluation, and the potential downstream revenue if a patient does have cancer and a treatment diagnosis.

Dashboard Tab – Risk, Checkmarks, Info Buttons

Risk Mitigation Financial Value

The financial value in the **LungPLAN** model includes the impact of reducing the risk of potential litigation from missing a lung cancer or nodule. In conjunction with an efficient and highly functional lung cancer screening program that uses software to monitor and follow-up on patients, this risk mitigation value reduces the potential litigation risk and related payment settlements.

<input checked="" type="checkbox"/> Risk Mitigation ⓘ	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reduce Risk Impact	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000
TOTAL	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000

Using the Checkmarks for Financial Value

The Dashboard tab also allows the user to determine whether a particular financial value should be included in the financial model or not. For each financial value category, a checkmark can turn a financial impact area On or Off.

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Using Checkmarks for Lung Cancer Screens and Diagnostic Evaluations

For example, in a lung cancer screening program, the organization may only want to model the potential 1) lung cancer screening reimbursement and 2) diagnostic evaluation reimbursement. The checkmarks for each reimbursement category should be checked On, and all other financial value categories, Stage 1-4 downstream revenue and ASF treatment revenue will be turned Off. Once these checkmarks are turned On or Off, only those financial values with a checkmark will show the financial impact for the 5-year timeframe.

<input checked="" type="checkbox"/>	Lung Cancer Screening Program - Financial Value	
<input checked="" type="checkbox"/>	Lung Cancer Screening Reimbursement	
<input checked="" type="checkbox"/>	Diagnostic Evaluation Reimbursement	
<input checked="" type="checkbox"/>	Stage 1: Downstream Treatment Revenue	
<input checked="" type="checkbox"/>	Stage 2: Downstream Treatment Revenue	
<input checked="" type="checkbox"/>	Stage 3: Downstream Treatment Revenue	
<input checked="" type="checkbox"/>	Stage 4: Downstream Treatment Revenue	
<input checked="" type="checkbox"/>	ASF Treatment Revenue	

Using Checkmarks for a Lung Cancer Program

All checkmarks should be turned on to model the financial value of a lung cancer screening program only, except for the actionable significant finding (ASF) financial value. Turning ASF value Off will model only the financial values for a lung cancer screening program, which includes the screening and diagnostic evaluation reimbursement and potential downstream revenue for years 1-5.

Yellow Information Buttons

On the Dashboard tab, you may see a yellow Information Button icon. By clicking on this icon, a box will open to provide additional detailed information specific to a particular category. This information button provides just enough information to help you better understand a particular topic. Clicking the okay button in the information box will cause the box to disappear



Dashboard Tab – Investment Costs & Cash Flow

Investment Costs

To fully support a lung cancer screening program or a focus on incidentally detected lung nodules from chest CT scans, an organization may need to invest in different areas to have a successful program. These suggested investment costs show the type of investments your organization may need to support these initiatives. Potential investment costs to consider include:

- Software – depends on the requirements of your organization
- Hardware – required to support program software
- Staffing – includes nurse navigator salary, outreach resources, other clinical personnel

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- Marketing/Outreach – marketing or outreach costs needed to support and market the programs
- Infrastructure (leasing, building rental) – location(s) to support a lung screening program
- Other Costs – a catch-all category to include additional costs not modeled in the table
- Costs avoided - includes the yearly licensing costs for a current software package

Investment Costs						
Infrastructure Investment Costs	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Software ⓘ	\$50,000	\$53,000	\$56,000	\$59,000	\$62,000	\$280,000
Hardware ⓘ	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$100,000
Staffing ⓘ	\$100,000	\$125,000	\$130,000	\$135,000	\$430,000	\$920,000
Marketing/Outreach ⓘ	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$50,000
Infrastructure (e.g. leasing, building rental, etc.) ⓘ	\$0	\$0	\$0	\$0	\$0	\$0
Any Other Costs (this is a "catch-all" category) ⓘ	\$0	\$0	\$0	\$0	\$0	\$0
Costs Avoided, if any (negative values) ⓘ	\$0	\$0	\$0	\$0	\$0	\$0
Total Investment Costs	\$180,000	\$208,000	\$216,000	\$224,000	\$522,000	\$1,350,000

Investment Summary

Including the potential investment costs to support these programs will assist in understanding the overall financial requirements of a functioning and successful lung cancer screening program.

Net Cash Flow Overview

At the bottom of the Dashboard tab, the total net cash flow is calculated over a 5-year period. The net cash flow table shows the financial value created each year, subtracts the investment costs for the year and summarizes the net cash flow totals over a 5-year period.

Net Cash Flow						
Cash Flow	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Financial Value	\$1,153,700	\$868,000	\$829,800	\$952,400	\$1,109,800	\$4,913,700
Investment Costs	(\$180,000)	(\$208,000)	(\$216,000)	(\$224,000)	(\$522,000)	(\$1,350,000)
Net Cash Flow	\$973,700	\$660,000	\$613,800	\$728,400	\$587,800	\$3,563,700

The net cash flow table provides a financial summary of the analysis completed at your organization. A positive net cash flow means that the financial value created is greater than the investment costs, which is a great financial message. If there is a negative net cash flow, the investment costs may be too high or the financial values too low. The next step in modeling would be to reduce the investment costs or increase the financial value to show a positive net cash flow.

Baseline Metrics – Volume & Distributions

The default metrics used throughout the model are located on the Baseline Metrics tab. The metrics may be modified on an as-needed basis. Users of the **LungPLAN** model can use the default metrics

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to create financial assessments that represent the overall financial value of a lung cancer screening and lung nodule management program. Metrics on this tab include:

Distribution of Lung Cancer and Lung Nodule Patients for Each Workflow

- Negative Screen: percent of patients continuing to an annual screening process
- Follow-Up Patients: nodules identified fall below threshold management & require further screening
- Dx Pathway Patients: nodules identified above threshold management & care is escalated
- Not Eligible for Future Screens: no longer included in the screening process and drop-out of program
- Actionable Significant Finding (ASF): no lung cancer but require additional follow-up care

Testing of Abnormal Screens for Each Workflow

- Follow-Up Patients: percent of patients requiring a diagnostic evaluation after interval imaging
- Diagnostic Evaluation – Interval Imaging: percent of patients referred to interval imaging
- Diagnostic Evaluation – Suspected Cancer: percent of patients with cancer

Payer Distribution

- Distribution of patients by payer: This can be updated by organization type.
- Includes commercial, Medicare, Medicaid, self-pay/other. Will total to 100% for all payers

Fee for Service (FFS) Rate

- Percent of patients who fall into an FFS reimbursement contract. Default FFS = 90%
- Only patients in FFS reimbursement are included in the **LungPLAN** model

Base Fall-Out Rates

- Annual Lung Cancer Screens: percent of patients who should do annual lung screens but fall out
- Lung Cancer Treatment: percent of patients who should continue treatment, but stop
- ASF Treatment: percent of ASF patients who should continue treatment, but stop

Lung Cancer Distribution: Cancer Incidence Rate for Screening Results – Lung Cancer Patients

- Used to adjust the Cancer Incidence Rate on the Dashboard tab from the current default rate
- A low rate, using a negative percent, assumes there are fewer patients with cancer in your area
- A high rate, using a positive percent, assumes there are more patients with cancer in your area

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- Adjusting this percent will impact the Negative Screens, F/U & Dx Pathway patient percent distribution

Lung Nodule Distribution: Cancer Incidence Rate for Screening Results – Nodule Patients

- Used to impact the Cancer Incidence Rate on the Dashboard tab from the current default rate
- A low rate, using a negative percent, assumes there are fewer nodule patients with cancer
- A high rate, using a positive percent, assumes there are more nodule patients with cancer
- Adjusting this percent will impact the nodule Negative Screens, F/U & Dx Pathway patient percent distribution

Baseline Metrics – Reimbursement

The default metrics used throughout the model are located on the Baseline Metrics tab. The metrics on this tab may be modified on an as-needed basis. Users of the **LungPLAN** model can use these default metrics and create a financial assessment that represents the overall financial value of a lung cancer screening and lung nodule program. Metrics on this tab are shown below.

Nurse Navigator Impact

- Overall impact a nurse navigator has on drop-out rates
- A low nurse navigator impact means less effective; more patients will leave the program.
- A high nurse navigator impact means nurse navigators are more effective; fewer patients will drop out.
- Nurse navigators can impact annual lung cancer screens, lung cancer treatment, and ASF treatment.

Lung Cancer Screening Reimbursement

- Assumes a commercial reimbursement default of \$250 for an individual lung cancer screen
- The yellow cell/blue font means this reimbursement rate can be adjusted for your organization
- Medicare = 50% of the Commercial reimbursement
- Medicaid = 70% of the Medicare reimbursement
- Self-Pay/Other = 50% of the Commercial reimbursement

Diagnostic Evaluation Reimbursement

- Assumes a reimbursement default of \$5,440 for an individual diagnostic evaluation
- The yellow cell/blue font means this reimbursement rate can be adjusted for your organization

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- Medicare = 50% of the Commercial reimbursement
- Medicaid = 70% of the Medicare reimbursement
- Self-Pay/Other = 50% of the Commercial reimbursement

Actionable Significant Finding Reimbursement

- Assumes a Medicare reimbursement default for a ASF treatment (default = \$6,621)
- The yellow cell/blue font means this reimbursement rate can be adjusted for your organization
- Commercial = 2x the Medicare reimbursement
- Medicaid = 70% of the Medicare reimbursement
- Self-Pay/Other = 50% of the Commercial reimbursement

Baseline Metrics – Stage Shifting

The default metrics used in the model are located on the Baseline Metrics tab. The metrics on this tab may be modified on an as-needed basis. Users of the **LungPLAN** model can modify the default metrics to create a financial assessment that represents the overall financial value of a lung cancer screening program and lung nodule program. The metrics on this tab are shown below.

Stage Shifting: Years 1 - 5

Assumes, over time, with an efficient and functioning lung cancer screening program, that more patients are diagnosed with lung cancer at an earlier stage. Over time, more patients will fall into Stage 1 & 2 diagnoses versus Stages 3 & 4 diagnoses.

- Stage 1: a 4% increase, every year, after Year 1
- Stage 2: a 2% increase, every year, after Year 1
- Stage 3: a 3% reduction, every year, after Year 1
- Stage 4: calculates the remaining differences from Stages 1 - 3

Lung Cancer Distribution by Stage	Year 1	Year 2	Year 3	Year 4	Year 5
Stage 1: increase 4% from Year 1	35%	39%	43%	47%	51%
Stage 2: increase 2% from Year 1	10%	12%	14%	16%	18%
Stage 3: reduce 3% from Year 1	19%	16%	13%	10%	7%
Stage 4 - (calculated)	36%	33%	30%	27%	24%
Total	100%	100%	100%	100%	100%

Reflects "Stage Shifting" over time, as more patients are diagnosed with Lung Cancer at an earlier stage.¹⁴

Stage 1: increase 4% every year beginning in Year 1
 Stage 2: increase 2% every year beginning in Year 1
 Stage 3: reduce 3% every year beginning in Year 1
 Stage 4: calculates remaining difference from Stages 1-3

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Baseline Metrics – Stage 1 Information

The default metrics used throughout the model are located on the Baseline Metrics tab. The metrics on this tab may be modified on an as-needed basis. Users of the **LungPLAN** model can use these default metrics and create a financial assessment that represents the overall financial value of a lung cancer screening and nodule management program. Metrics on this tab are shown below.

Stage 1 Lung Cancer: Patient Distribution, Total Cost, and Contribution Margin Per Procedure

- Based on the payer distribution allocation
- **Assumes a total cost based on a Commercial reimbursement/procedure = \$86,868**
- Profit margins, variable costs, and contribution margin are calculated based on the Commercial reimbursement value.
- Total costs will remain the same for each payer, but reimbursement and contribution margins will vary depending on each payer.
- For example, Medicare reimbursement is 50% of the Commercial reimbursement value.
- The contribution margin, by payer, will be calculated based on individual payer reimbursement.
- Year 2 Total cost is 50% of Year 1 total cost, contribution margin by payer calculated accordingly
- Year 3 total cost is 50% of Year 2 total cost, contribution margin by payer calculated accordingly
- Year 4 total cost is 50% of Year 3 total cost, contribution margin by payer calculated accordingly
- Year 5 total cost is 50% of Year 4 total cost, contribution margin by payer calculated accordingly

Stage 1: Reimbursement and Contribution Margins		STAGE 1: Year 1 - Per Patient				
Payer	PMPM Cost (month)	Total Cost (10% margin)	Profit Margin (10%)	Average Reimbursement	Variable Cost (25% of total cost)	Contribution Margin (75%)
Commercial	\$7,239	\$86,868	10%	\$96,520	\$21,717	\$74,803
Medicare	50%	\$86,868		\$48,260	\$21,717	\$26,543
Medicaid	70%	\$86,868		\$33,782	\$21,717	\$12,065
Self-pay	50%	\$86,868		\$48,260	\$21,717	\$26,543
		\$86,868		\$61,580	\$21,717	\$39,863

STAGE 1: Year 2 - Per Patient		STAGE 1: Year 3 - Per Patient		STAGE 1: Year 4 - Per Patient		STAGE 1: Year 5 - Per Patient	
Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)
\$43,434	\$37,402	\$21,717	\$18,701	\$10,859	\$9,350	\$5,429	\$4,675
\$43,434	\$13,272	\$21,717	\$6,636	\$10,859	\$3,318	\$5,429	\$1,659
\$43,434	\$6,033	\$21,717	\$3,016	\$10,859	\$1,508	\$5,429	\$754
\$43,434	\$13,272	\$21,717	\$6,636	\$10,859	\$3,318	\$5,429	\$1,659
\$43,434	\$19,931	\$21,717	\$9,966	\$10,859	\$4,983	\$5,429	\$2,491

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Baseline Metrics – Stage 2 Information

The default metrics used throughout the model are located on the Baseline Metrics tab. The metrics on this tab may be modified on an as-needed basis. Users of the **LungPLAN** model can use these default metrics and create a financial assessment that represents the overall financial value of a lung cancer screening and lung nodule program. Metrics on this tab are shown below.

Stage 2 Lung Cancer: Patient Distribution, Total Cost, and Contribution Margin Per Procedure

- Based on the payer distribution allocation
- **Assumes a total cost based on a Commercial reimbursement/procedure = \$113,808**
- Profit margins, variable costs, and contribution margin are calculated based on the Commercial reimbursement value.
- Total costs will remain the same for each payer, but reimbursement and contribution margins will vary depending on each payer.
- For example, Medicare reimbursement is 50% of the Commercial reimbursement value.
- The contribution margin, by payer, will be calculated based on individual payer reimbursement.
- Year 2 Total cost is 50% of Year 1 total cost, contribution margin by payer calculated accordingly
- Year 3 total cost is 50% of Year 2 total cost, contribution margin by payer calculated accordingly
- Year 4 total cost is 50% of Year 3 total cost, contribution margin by payer calculated accordingly
- Year 5 total cost is 50% of Year 4 total cost, contribution margin by payer calculated accordingly

Stage 2: Reimbursement and Contribution Margins		STAGE 2: Year 1 - Per Patient				
Payer	PMPM Cost (month)	Total Cost (10% margin)	Profit Margin (10%)	Average Reimbursement	Variable Cost (25% of total cost)	Contribution Margin (75%)
Commercial	\$9,484	\$113,808	10%	\$126,453	\$28,452	\$98,001
Other Payer table percent inputs above		\$113,808		\$63,227	\$28,452	\$34,775
		\$113,808		\$44,259	\$28,452	\$15,807
		\$113,808		\$63,227	\$28,452	\$34,775
		\$113,808		\$80,677	\$28,452	\$52,225

STAGE 2: Year 2 - Per Patient		STAGE 2: Year 3 - Per Patient		STAGE 2: Year 4 - Per Patient		STAGE 2: Year 5 - Per Patient	
Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)
\$56,904	\$49,001	\$28,452	\$24,500	\$14,226	\$12,250	\$7,113	\$6,125
\$56,904	\$17,387	\$28,452	\$8,694	\$14,226	\$4,347	\$7,113	\$2,173
\$56,904	(\$14,226)	\$28,452	\$3,952	\$14,226	\$1,976	\$7,113	\$988
\$56,904	\$17,387	\$28,452	\$8,694	\$14,226	\$4,347	\$7,113	\$2,173
\$56,904	\$22,129	\$28,452	\$13,056	\$14,226	\$6,528	\$7,113	\$3,264

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Baseline Metrics – Stage 3 Information

The default metrics used throughout the model are located on the Baseline Metrics tab. The metrics on this tab may be modified on an as-needed basis. Users of the **LungPLAN** model can use these default metrics and create a financial assessment that represents the overall financial value of a lung cancer screening and lung nodule program. Metrics on this tab are shown below.

Stage 3 Lung Cancer: Patient Distribution, Total Cost, and Contribution Margin Per Procedure

- Based on the payer distribution allocation
- **Assumes a total cost based on a Commercial reimbursement/procedure = \$171,648**
- Profit margins, variable costs, and contribution margin are calculated based on the Commercial reimbursement value.
- Total costs will remain the same for each payer, but reimbursement and contribution margins will vary depending on each payer.
- For example, Medicare reimbursement is 50% of the Commercial reimbursement value.
- The contribution margin, by payer, will be calculated based on individual payer reimbursement.
- Year 2 Total cost is 50% of Year 1 total cost, contribution margin by payer calculated accordingly
- Year 3 total cost is 50% of Year 2 total cost, contribution margin by payer calculated accordingly
- Year 4 total cost is 50% of Year 3 total cost, contribution margin by payer calculated accordingly
- Year 5 total cost is 50% of Year 4 total cost, contribution margin by payer calculated accordingly

Stage 3: Reimbursement and Contribution Margins		STAGE 3: Year 1 - Per Patient				
Payer	PMPM Cost (month)	Total Cost (10% margin)	Profit Margin (10%)	Average Reimbursement	Variable Cost (25% of total cost)	Contribution Margin (75%)
Commercial	\$14,304	\$171,648	10%	\$190,720	\$42,912	\$147,808
Other Payer table percent inputs above		\$171,648		\$95,360	\$42,912	\$52,448
		\$171,648		\$66,752	\$42,912	\$23,840
		\$171,648		\$95,360	\$42,912	\$52,448
		\$171,648		\$121,679	\$42,912	\$78,767

STAGE 3: Year 2 - Per Patient		STAGE 3: Year 3 - Per Patient		STAGE 3: Year 4 - Per Patient		STAGE 3: Year 5 - Per Patient	
Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)
\$85,824	\$73,904	\$42,912	\$36,952	\$21,456	\$18,476	\$10,728	\$9,238
\$85,824	\$26,224	\$42,912	\$13,112	\$21,456	\$6,556	\$10,728	\$3,278
\$85,824	(\$21,456)	\$42,912	\$5,960	\$21,456	\$2,980	\$10,728	\$1,490
\$85,824	\$26,224	\$42,912	\$13,112	\$21,456	\$6,556	\$10,728	\$3,278
\$85,824	\$33,376	\$42,912	\$19,692	\$21,456	\$9,846	\$10,728	\$4,923

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Baseline Metrics – Stage 4 Information

The default metrics used throughout the model are located on the Baseline Metrics tab. The metrics on this tab may be modified on an as-needed basis. Users of the **LungPLAN** model can use these default metrics and create a financial assessment that represents the overall financial value of a lung cancer screening and nodule management program. Metrics on this tab are shown below.

Stage 4 Lung Cancer: Patient Distribution, Total Cost, and Contribution Margin Per Procedure

- Based on the Payer distribution allocation
- **Assumes a total cost based on a Commercial reimbursement/procedure = \$253,692**
- Profit margins, variable costs, and contribution margin are calculated based on the Commercial reimbursement value.
- Total costs will remain the same for each payer, but reimbursement and contribution margins will vary depending on each payer.
- For example, Medicare reimbursement is 50% of the Commercial reimbursement value.
- The contribution margin, by payer, will be calculated based on individual payer reimbursement.
- Year 2 Total cost is 50% of Year 1 total cost, contribution margin by payer calculated accordingly
- Year 3 total cost is 50% of Year 2 total cost, contribution margin by payer calculated accordingly
- Year 4 total cost is 50% of Year 3 total cost, contribution margin by payer calculated accordingly
- Year 5 total cost is 50% of Year 4 total cost, contribution margin by payer calculated accordingly

Stage 4: Reimbursement and Contribution Margins		STAGE 4: Year 1 - Per Patient				
Payer	PMPM Cost (month)	Total Cost (10% margin)	Profit Margin (10%)	Average Reimbursement	Variable Cost (25% of total cost)	Contribution Margin (75%)
Commercial	\$21,141	\$253,692	10%	\$281,880	\$63,423	\$218,457
Other Payer table percent inputs above		\$253,692		\$140,940	\$63,423	\$77,517
		\$253,692		\$98,658	\$63,423	\$35,235
		\$253,692		\$140,940	\$63,423	\$77,517
		\$253,692		\$179,839	\$63,423	\$116,416

STAGE 4: Year 2 - Per Patient		STAGE 4: Year 3 - Per Patient		STAGE 4: Year 4 - Per Patient		STAGE 4: Year 5 - Per Patient	
Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)	Total Cost (10% margin)	Contribution Margin (75%)
\$126,846	\$109,229	\$63,423	\$54,614	\$31,712	\$27,307	\$15,856	\$13,654
\$126,846	\$38,759	\$63,423	\$19,379	\$31,712	\$9,690	\$15,856	\$4,845
\$126,846	(\$31,712)	\$63,423	\$8,809	\$31,712	\$4,404	\$15,856	\$2,202
\$126,846	\$38,759	\$63,423	\$19,379	\$31,712	\$9,690	\$15,856	\$4,845
\$126,846	\$49,329	\$63,423	\$29,104	\$31,712	\$14,552	\$15,856	\$7,276

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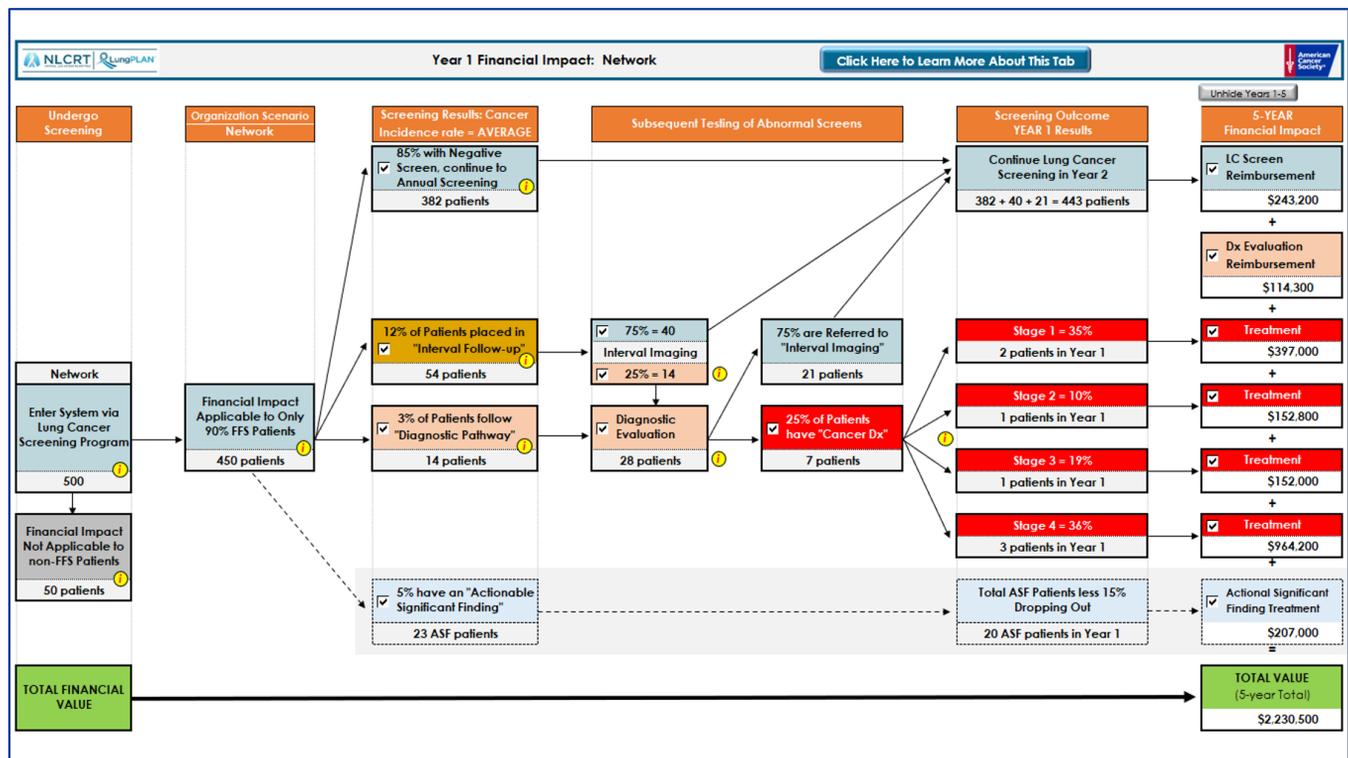
Lung Cancer Screening Workflow

The Lung Cancer Screening Workflow diagram shows how patients enter a lung cancer screening program and move through the different impact areas. All patients will follow this workflow, and the default metrics, and any updates to the metrics on the Baseline Metrics tab, will impact and appropriately distribute patients along the workflow.

Adjustments made on the Dashboard tab, and adjustments on the Baseline Metrics tab, will impact the patients in this workflow. Different checkmarks can be seen in distribution boxes throughout the workflow. Distribution boxes can be turned On/Off and will show calculation updates to the patient flow, patient volumes, and overall financial impact over a 5-year period.

This workflow provides an excellent view of how patients move through a lung cancer screening program. Different volumes based on incidence rates and stage shifting will show where patients will flow and eventually calculate the financial value of these patients over the 5-year period.

The intent of the Lung Cancer Screening Workflow screen is to simplify a very complex, highly variable patient flow process. The screen provides a helpful, at-a-glance view of patient movement that helps to show the patient flow distribution and the associated financial impacts.



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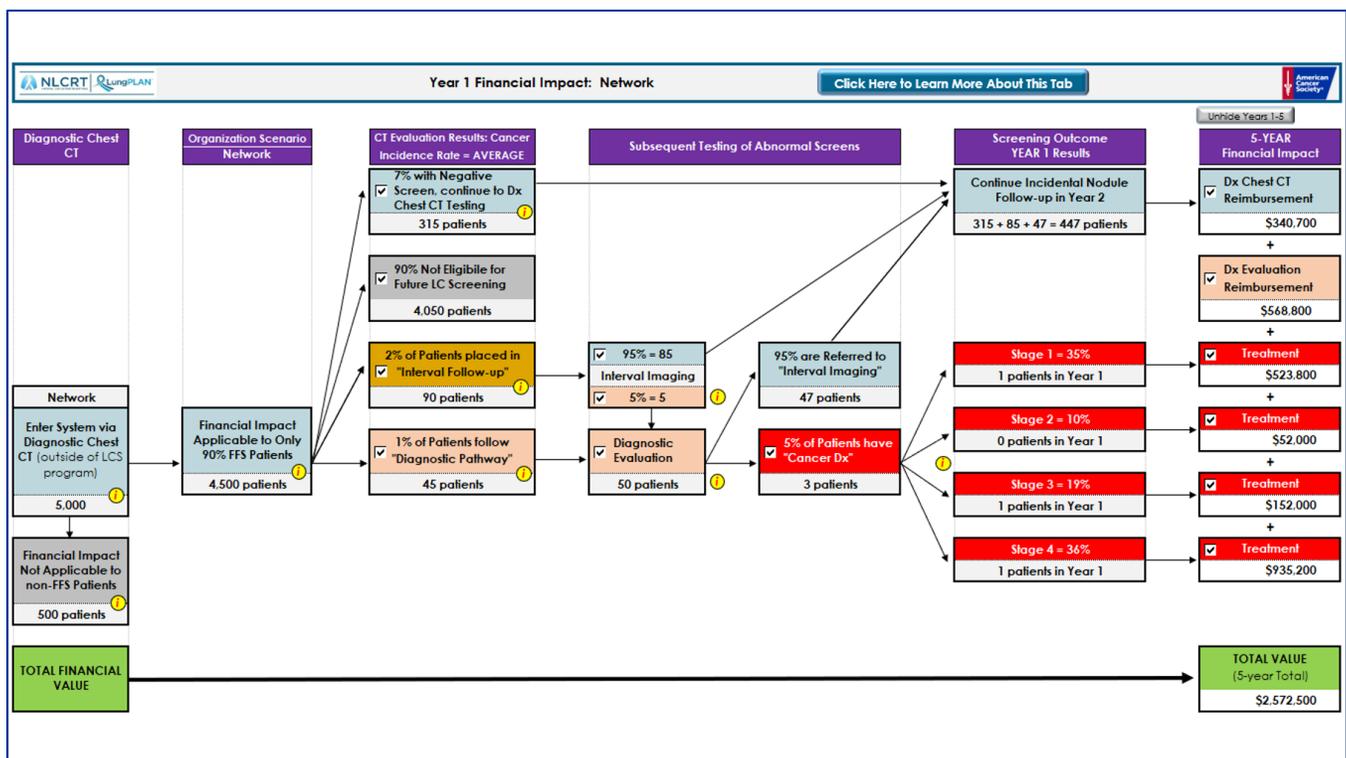
Incidentally Detected Lung Nodules Workflow

The Incidentally Detected Lung Nodule Workflow provides a diagram of the patients as they receive a chest CT scan and then flow into the different sections. All chest CT patients follow this workflow, and the default metrics, and any updates to the metrics on the Baseline Metrics tab, will impact and appropriately distribute patients along the workflow.

Adjustments made on the Dashboard and Baseline Metrics tabs will impact the patients in the workflow. Different checkmarks can be seen in distribution boxes throughout the workflow. Distribution boxes can be turned On/Off and will show calculation updates to the patient flow, patient volumes, and overall financial value over a 5-year period.

This workflow provides an excellent view of how chest CT patients move through an incidentally detected lung nodule program. Different volumes based on incidence rates and stage shifting will show where patients will flow. The diagram shows the financial value of these patients over the 5-year period.

The intent of the Incidentally Detected Lung Nodule Workflow screen is to simplify a very complex, highly variable patient flow process. The screen provides an at-a-glance view of patient movements that helps to show the patient flow distribution and the associated financial impacts.



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Output Tab

The intent of the **LungPLAN** financial model is to provide clinical and financial information to determine the financial value at your organization of:

- A lung cancer screening program
- Chest CT patients where an incidentally detected lung nodule is found

By determining the number of patients entering each workflow, an organization can prepare to identify, treat, and manage these patients within the organization. Understanding the cancer incidence rate in your area will impact the volume of patients to be seen at your organization. Different facilities will provide different types of services, and the intent of the **LungPLAN** business model is to project and estimate the financial values of the services provided by your organization.

The Output tab is meant to be printed and shows the results from the modeling efforts. The Output report can be used as a stand-alone document, or the information can be used to create a PowerPoint presentation to better communicate modeling results.

The Output tab provides summary information for a 5-year period by selected workflow and shows volumes, reimbursement, downstream revenue, allocation of financial value, projected investment costs, and the metrics finance professionals will be looking for, such as IRR, NPV, payback period, and net cash flows. Finally, all metrics and data sources are included in the output to ensure the **LungPLAN** model meets data integrity standards.

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Sources

Throughout the **LungPLAN** model, various footnotes appear on the Baseline Metrics tab and other tabs to show where a metric source is used. The table below identifies the data sources used to create the baseline metrics for the modeling.

Note	Description	Source
A	Eligible population = 3.90%	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6462682
B	Payer Distribution	Hospital and Health Systems Trends - 2018
C	Percent of Interval F/U Patients - Nodules BELOW Threshold Management/Require Screening	National Radiology Data Registry - 2020 (https://nrdrsupport.acr.org/support/solutions/articles/11000039783-lcsr-available-reports)
D	Percent of Dx Pathway Patients - Nodules ABOVE Threshold Management/Care Escalation	National Radiology Data Registry - 2020 (https://nrdrsupport.acr.org/support/solutions/articles/11000039783-lcsr-available-reports)
E	Percent of Patients not Eligible for Future Lung Cancer Screening - drop out	National Radiology Data Registry - 2020 (https://nrdrsupport.acr.org/support/solutions/articles/11000039783-lcsr-available-reports)
F	Patients with Actionable Significant Finding (ASF): No Lung Cancer but requires follow-up	National Radiology Data Registry - 2020 (https://nrdrsupport.acr.org/support/solutions/articles/11000039783-lcsr-available-reports)
G	Percent of Interval F/U Patients - Require Diagnostic Evaluation after Interval Imaging	National Radiology Data Registry - 2020 (https://nrdrsupport.acr.org/support/solutions/articles/11000039783-lcsr-available-reports)
H	Results from Diagnostic Evaluation (Dx): Interval Imaging - Referred to Interval Imaging	National Radiology Data Registry - 2020 (https://nrdrsupport.acr.org/support/solutions/articles/11000039783-lcsr-available-reports)

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Note	Description	Source
I	Results from Diagnostic Evaluation (Dx): Suspected Cancer - Patients with Cancer	National Radiology Data Registry - 2020 (https://nrdrsupport.acr.org/support/solutions/articles/11000039783-lcsr-available-reports)
J	Fall-out rates: Annual Lung Cancer Screens, Lung Cancer Treatment, ASF treatment	National Radiology Data Registry - 2020 (https://nrdrsupport.acr.org/support/solutions/articles/11000039783-lcsr-available-reports)
K	Commercial reimbursement = 100%. Medicare = 50% of Commercial, Medicaid = 70% of Medicare, Self-pay = 50% of Commercial.	https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalOutpatientPPS/Hospital-Outpatient-Regulations-and-Notices-Items/CMS-1717-P
L	Commercial reimbursement, at \$5,440, from CMS 2020 addendum J	https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalOutpatientPPS/Hospital-Outpatient-Regulations-and-Notices-Items/CMS-1717-P
M	Actionable Significant Finding Reimbursement	Medicare Reimb: MS-DRG 190: \$6,621: COPD w/MCC - 2021 DRG National Average Payment Table
N	Cancer Diagnosis Stage Shifting by Year	Management of Pulmonary Nodules by Community Pulmonologists: A Multicenter Observational Study, Tanner NT, Aggarwal J, Gould MK, Kearney P, Diette G, Vachani A, Fang KC, Silvestri GA.
O	Downstream Revenue: Reimbursement and Contribution Margins by Stage	https://pubmed.ncbi.nlm.nih.gov/28553128/ L
P	Risk mitigation value	www.radiologybusiness.com/topics/business/medical-malpractice-are-you-covered

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Need Help?

A variety of Help features are available in the LungPLAN model, which was designed to provide specific help information on metrics or other information within the model. The different kinds of Help available include:

Located Within the LungPLAN Model

- Blue "Learn About" buttons provide additional information for a tab. 
- Yellow "i" buttons provide information on different metrics and topics. 
- Yellow cells with blue font text can be edited to change values 
- Information tabs such as the NLCRT Introduction tab, User Instructions, Starting a Program, and Need Help tabs provide information about how to use the model.

External LungPLAN Model Resources

The LungPlan web pages on the NLCRT website provide additional resources to support your modeling efforts. Information about the model will be continually updated as LungPLAN-relevant new studies, research, and lessons learned become available.

- LungPLAN overview: <https://nlcrt.org/lungplan-overview>
- LungPLAN resources: <https://nlcrt.org/lungplan-benefits/benefits>
- LungPLAN resources: <https://nlcrt.org/lungplan-model/>
- LungPLAN resources: <https://nlcrt.org/lungplan-resources>

Contact NLCRT with Additional Modeling Questions

You may have questions that are not answered by information in the model or on the NLCRT website. If so, you can send an email to the NLCRT. **Please be sure to attach your LungPLAN modeling file to your email.**

- Email your question to: nlcrt@cancer.org
- Please include the following information:
 - Title or position, and Organization
 - Your Question

The NLCRT intends to provide ongoing support, either embedded within the model or on the NLCRT website, to assist in your modeling efforts.

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Thank You

Thank you for your interest in this tool. We have heard from many colleagues that it is difficult to anticipate when and how to implement a lung cancer early detection program. This tool is designed to answer those questions and was created by clinicians and health systems leaders affiliated with the NLCRT.