



### Adam D Wells MD FCCP

Section Chief, Pulmonary & Critical Care  
Nebraska Methodist Hospital

# Colorectal Cancer

## *A Pulmonologist's Perspective*

How Our Advanced Bronchoscopy Program Supports  
Multidisciplinary Colorectal Cancer Care

1

## Why Is the Pulmonologist in the Room?

### The Lungs: CRC's #2 Metastatic Target

- The lung is the second most common metastatic site in CRC, after the liver.
- Lung metastases develop in 10–15% of all CRC patients. Among stage IV patients, prevalence is higher in rectal cancer (~38%) than colon cancer (~30%).
- 15–45% of staging chest CTs reveal pulmonary nodules—but only approximately 16–26% of these are truly metastatic.

**This creates a diagnostic challenge: which nodules require tissue, and how do we get it safely?**

**10–15%** of all CRC patients develop pulmonary metastases

*Moorcraft et al., 2021*

**~32%** of stage IV CRC patients have lung involvement

*Kruger et al., 2021*

**~26%** of mCRC patients have lung mets at dx

*Ge et al., 2020*

Moorcraft et al. Ther Adv Med Oncol 2021 (PMID8107514) • Ge et al. Int J Colorectal Dis 2020;35:223–232 • Kruger et al. Cancers 2021 (PMID8700218) • Nordholm-Carstensen. Dan Med J 2016 (PMID 26726908) • Chen et al. Front Oncol 2022

2

## Pulmonary Metastases in CRC: Clinical Significance



### Timing Matters

Synchronous mets (~7.5%) at diagnosis vs. metachronous mets after treatment. Metachronous mets have better prognosis: mean OS 4.25 vs. 2.14 years.



### Tissue Is the Issue

Molecular profiling (KRAS, BRAF, MSI) of lung mets guides targeted therapy — adequate tissue for NGS is essential.



### Resectability Assessment

5-year Overall Survival 35–68% after complete resection. Accurate staging determines surgical candidacy.

References: 1. Gonzalez M, et al. Ann Surg Oncol. 2013;20(2):572–579. 2. Ampollini L, et al. J Thorac Dis. 2017;9(Suppl 12):S1282–S1290. 3. Shishido Y, et al. J Cardiothorac Surg. 2023;18:327. 4. Park JS, et al. Korean J Thorac Cardiovasc Surg. 2016;49(6):415–422. 5. Limmer S, et al. Langenbecks Arch Surg. 2020;395:1129–1138. 6. NCCN Guidelines: Colon Cancer (v2.2025). 7. Nordholm Carstensen. Eur J Cancer 2014 (PMID 24268534). 8. Al-Ghantari et al. World J Surg Oncol. 2022 (PMID 3142403).

3

## The Diagnostic Challenge

*Pulmonary nodules in CRC patients are common — but not all are metastatic.*

### THE CHALLENGE

- CT-guided biopsy has high yield but significant complication risk
- Pneumothorax rates of 15–25% with percutaneous approaches
- Conventional bronchoscopy yield ~34% for peripheral/sub-2cm lesions
- Many CRC patients have significant pulmonary comorbidities

### OUR SOLUTION

- Robotic navigational bronchoscopy with real-time imaging
- Pneumothorax rate <4% — often 0% in experienced hands
- 85–92% diagnostic yield including peripheral and sub-cm lesions
- Same-session multifocal biopsy and mediastinal staging

4

## Our Advanced Bronchoscopy Program

A Comprehensive, High-Volume Platform for Pulmonary Diagnostics



### Intuitive Ion™ Navigational Bronchoscopy

Shape-sensing robotic platform with ultra-thin catheter for peripheral lung access



### Cios Cone Beam CT

Intra-procedural 3D imaging for real-time tool-in-lesion confirmation



### Specialized Respiratory Therapists

Dedicated, specially trained respiratory therapists ensuring optimal procedural support and patient care



### Radial Ultrasound

360° miniature ultrasound visualization for precise peripheral lesion localization and confirmed tissue sampling



### Expert Cytotechnologists

Dedicated cytology specialists providing rapid on-site evaluation for immediate diagnostic confidence



### Van Gogh™ DCI Microscopy

Real-time metabolic heat maps for intra-procedural tissue adequacy assessment

5

## Intuitive Ion™ Robotic Navigational Bronchoscopy

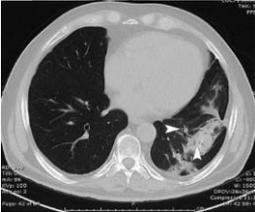
### How It Works

- Pre-procedural CT generates a 3D lung roadmap
- Real-time shape-sensing fiber optic catheter position tracking
- Ultra-thin 3.5mm articulating catheter reaches deep peripheral airways
- Cios Cone Beam CT confirms tool-in-lesion in real time (3D)
- Single catheter deploys FNA, cryobiopsy, and brush sampling
- Cytotechnologist present for ROSE in every case

### KEY ADVANTAGES

- ✓ 100% lesion localization rate
- ✓ Diagnostic yield 85–92%
- ✓ Pneumothorax rate <4%
- ✓ Same-session bilateral sampling
- ✓ Combined staging + tissue acquisition
- ✓ Outpatient procedure in most cases
- ✓ Gentle learning curve (~25 cases)

6



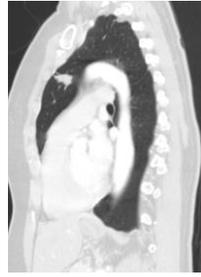
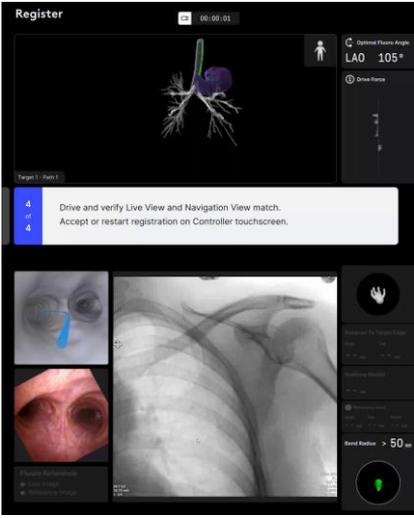
7

## Ion™ Navigational Bronchoscopy: Case Example

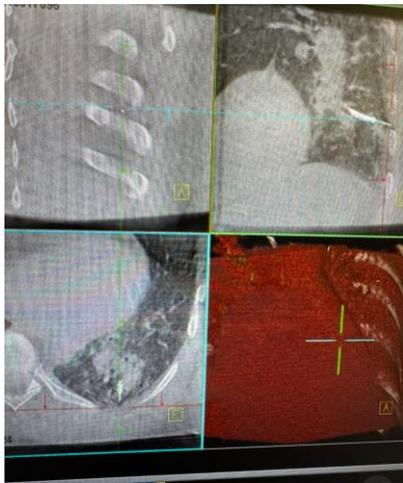
Robotic shape-sensing navigation • Cone beam CT confirmation • Real-time biopsy guidance



8



9



10

## Van Gogh™ Dynamic Cell Imaging (DCI)

*Real-Time Tissue Adequacy Assessment at the Point of Care*

### How DCI Works

- Analyzes biopsy tissue to 150µm depth using fancy science
- Measures intracellular metabolic activity in real-time—no cutting or staining required
- Generates metabolic "heat maps" showing cell type, size, shape, and activity
- Distinguishes cancer cells, immune cells, and granuloma in ~2 minutes
- Preserves 100% of tissue for final pathology and NGS

**>90%**

accuracy for tissue adequacy assessment (vs. 45–75% with traditional ROSE)

**100%**

of samples available for further testing/review or NGS

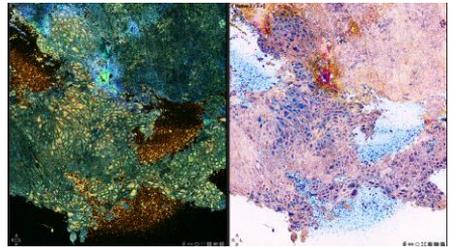
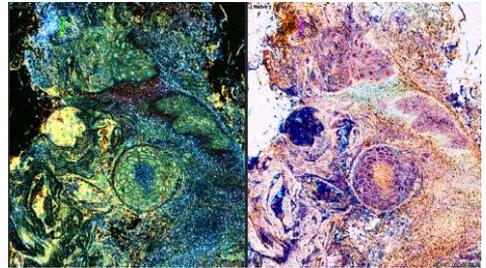
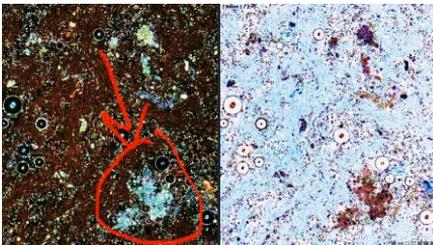
**~2  
min**

from biopsy to adequacy result  
—while patient is still on table

1. Nemeih CN et al. Am J Respir Crit Care Med 2025;211:A2723. 2. Dynamic Cell Imaging as an Alternative to ROSE in Robotic Bronchoscopy. Am J Respir Crit Care Med 2025;211:A5487. 3. Kovacs S et al. ROPE: DCI Concordance in FPI Evaluation. Presented at CHEST 2024.

11

## Van Gogh™ DCI — Actual Case Images



12

## Final results from a prospective, multi-center clinical study: **CONFIRM**<sup>1</sup>

155 subjects enrolled at 6 centers with 14 users; median nodule size: 14 mm.

**91%** Diagnostic yield<sup>2</sup>

**91.5%** Sensitivity for malignancy

The CONFIRM study evaluated Ion integrated with mobile cone beam CT.

**A strong safety profile: 0%**

pneumothorax of any kind and 1.3% clinically significant bleed

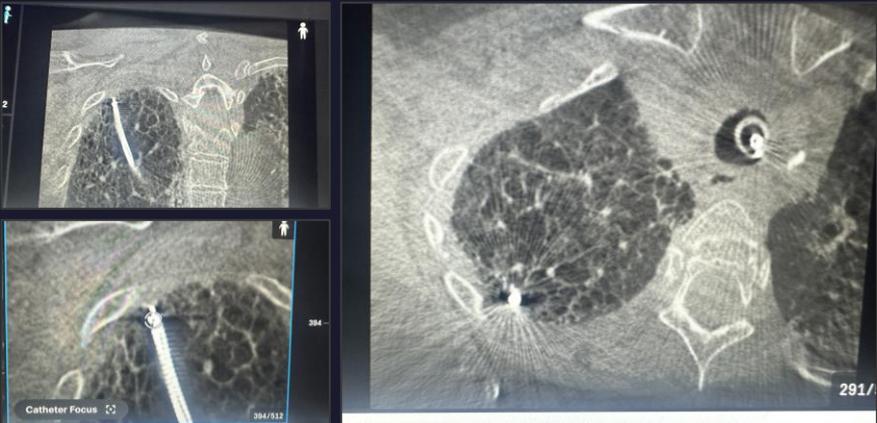
1. Hustia BC, Cheng CZ, Batra H, et al. Shape-sensing robotic-assisted bronchoscopy with integrated mobile cone-beam CT for small nodules: results from the prospective multicentre CONFIRM study. *Thorax*. Published Online First: 01 December 2025. doi: 10.1136/thorax-2025-222272
2. Study defined diagnostic yield allowed follow-up data when index bronchoscopy pathology showed tissue representative of nodule and consistent with a benign process. ATS/ACCP Diagnostic yield was 89%.

INTUITIVE © 2025 Intuitive Surgical Operations, Inc. All rights reserved.



13

## Nothing is out of reach...



14



15

## Multimodal Tissue Acquisition Strategy

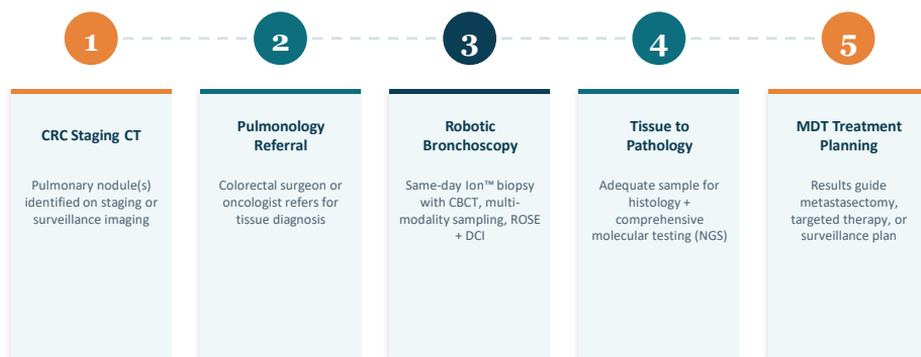
Every case leverages multiple sampling techniques with cytotechnologist ROSE



**Why This Matters for CRC Patients:** Molecular profiling of lung metastases (KRAS, BRAF, MSI, HER2) directly guides systemic therapy decisions. Our multimodal approach ensures adequate tissue for comprehensive NGS in virtually every case — enabling oncology to initiate targeted treatment without delays or repeat procedures.

16

## The Patient Journey: From Nodule to Treatment



*Bridging the Gap Between Colorectal Surgery, Pulmonology & Oncology*

17

## Impact on Patient Care

### Faster

#### Time to Tissue Diagnosis

Same-day biopsy with real-time adequacy confirmation eliminates repeat procedures and diagnostic delays

### Safer

#### Minimally Invasive Approach

Pneumothorax rate <4% vs. 15–25% with CT-guided biopsy — critical for CRC patients who may need surgery

### Smarter

#### Comprehensive Molecular Data

Multimodal sampling + Van Gogh DCI ensures adequate tissue for NGS to guide targeted therapy decisions

### Stronger

#### Multidisciplinary Collaboration

Streamlined referral pathway between colorectal surgery, pulmonology, and oncology accelerates treatment

18

# Thank You to Our Team



*Our Advanced Bronchoscopy Program Team*



# Thank You

*Questions & Discussion*

Adam D Wells MD, FCCP  
Section Chief, Pulmonary & Critical Care Medicine  
Nebraska Methodist Hospital



## Let's Collaborate

We're here to support your  
CRC patients with rapid,  
minimally invasive diagnosis.

[Adam.Wells@nmhs.org](mailto:Adam.Wells@nmhs.org)