

Welcome to the Sentinel Innovation and Methods Seminar Series

The webinar will begin momentarily

Please visit www.sentinelinitiative.org for recordings of past sessions and details on upcoming webinars.

Note: closed-captioning for today's webinar will be available on the recording posted at the link above.

Imagine a world where
real-world caution becomes
real-world confidence.

Introducing...



ontada



Measure what you
treasure...

June 2021

Sarah A Alwardt, PhD
Vice President RWD/RWE
Ontada

Agenda

- Background and introduction to Ontada
- Real World Endpoints and challenges - how to evolve collection
 - Traditional
 - Contemporary
 - Future
- Thoughts for Sentinel

The oncology landscape continues to become more complex

Tailwinds

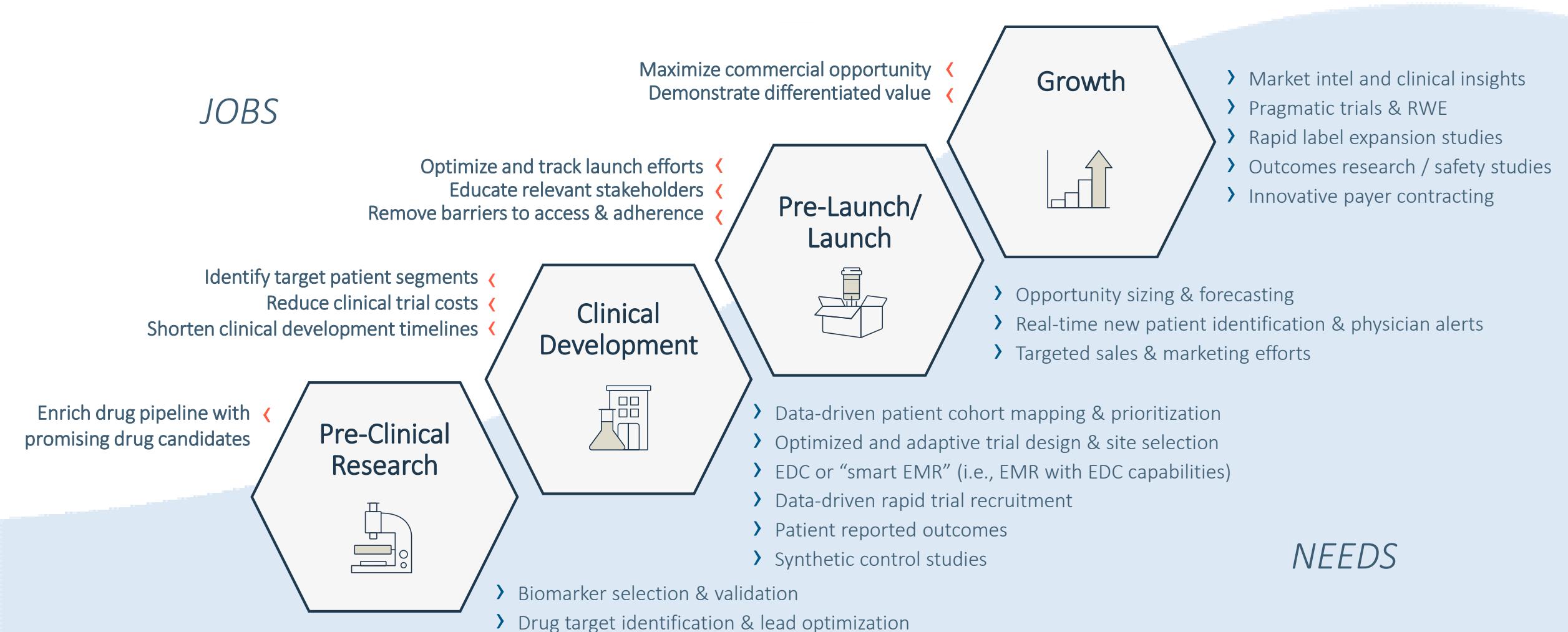
-  Molecularly-guided therapies
-  Greater connectivity of oncology ecosystem
-  Integration of real-world evidence
-  Value-based care

Headwinds

-  COVID-19 pandemic
-  Awareness of rapidly changing science
-  Maintaining workflow given complexity of care
-  Keeping the patient in the community



And at the same time, oncology life sciences companies have several key jobs-to-be-done



R&D teams are focused on finding and expediting promising new therapies for FDA approval



Manage
R&D pipeline & product
differentiation strategies



Develop
clinical research
protocols



Identify new
clinico-genomic
targets



Identify &
validate potential
companion diagnostics



Find the
right patient
for the right trial



Understand
efficacy &
side effects



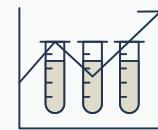
Gather evidence for
regulatory
approvals



Optimize
clinical
trial operations



Commercial teams are focused on maximizing treatment optimization



Understand market size & segmentation



Find the right patients



Educate relevant stakeholders



Demonstrate differentiated value



Identify barriers to access



Drive a positive patient experience

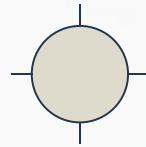


Expand into new indications

Medical & RWE teams are focused on understanding a therapy's effectiveness & safety in a real-world setting



Optimize relationships
and educate key
thought leaders &
stakeholders



Ensure
timely and relevant
evidence &
insights



Analyze
disease burden
& unmet need



Understand
patterns of therapy &
optimal place in therapy



Generate
evidence of therapy
value



We're here to help

ontada

Our vision

Transform the fight against cancer

How we'll
do it

Partner with life sciences and providers to advance technology and real-world insights across the oncology continuum

Commitment
to you

Deliver on the promise of real-world insights to drive innovation across the development lifecycle

It all starts with real-world data you can trust

Today our RWD and expertise are trusted to power key oncology research & decisions

Regulatory decision-making



RWD power numerous regulatory studies & the **first FDA approval** of a first-line therapy in oncology

Life sciences decision-making



RWD support a broad range of retrospective analyses & commercial insights

Provider decision-making



RWD power provider technologies that support evidence-driven decisions at the point-of-need

Published RWE studies



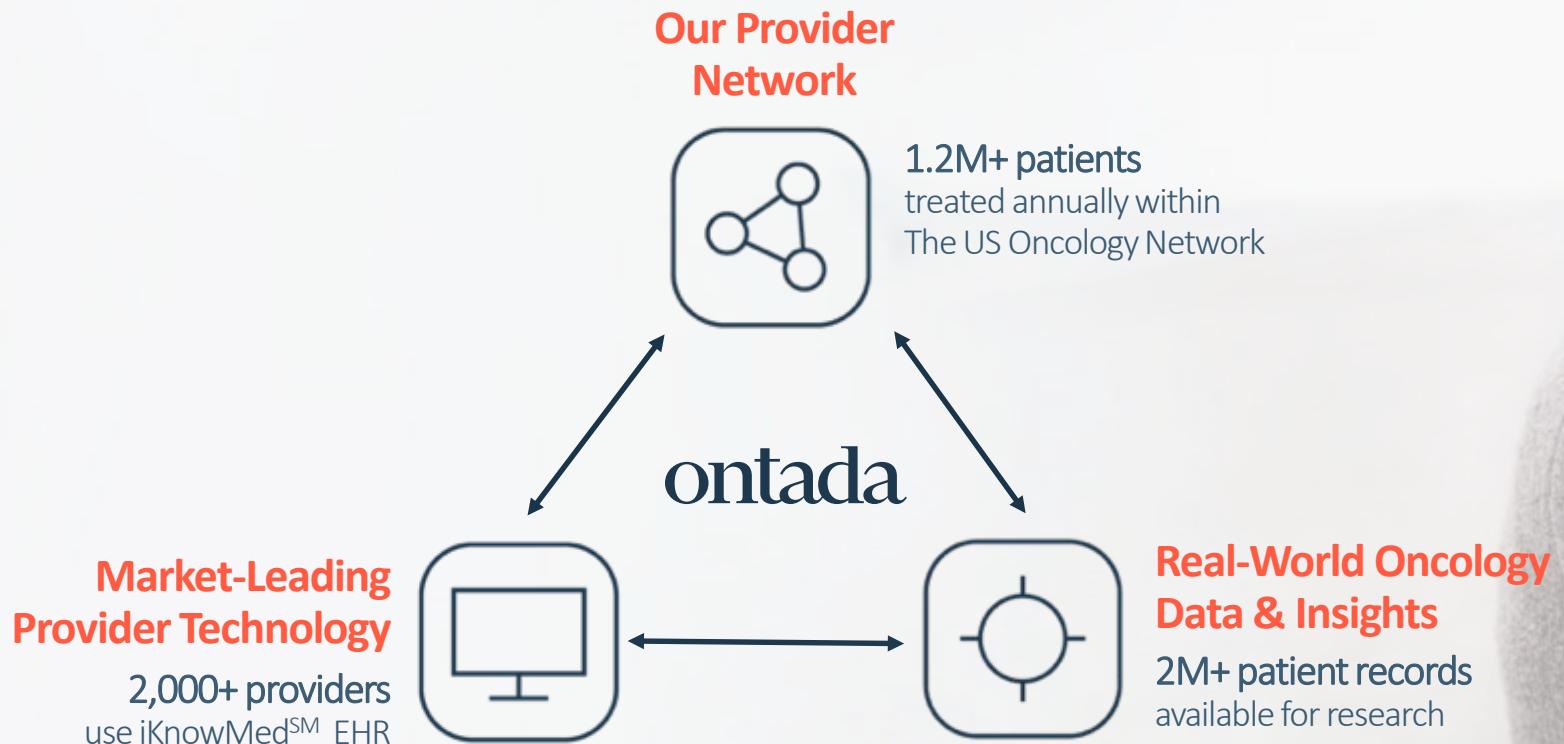
RWD used in **175+ RWE studies** in leading industry publications for 70+ oncology indications

New standards for real-world endpoints

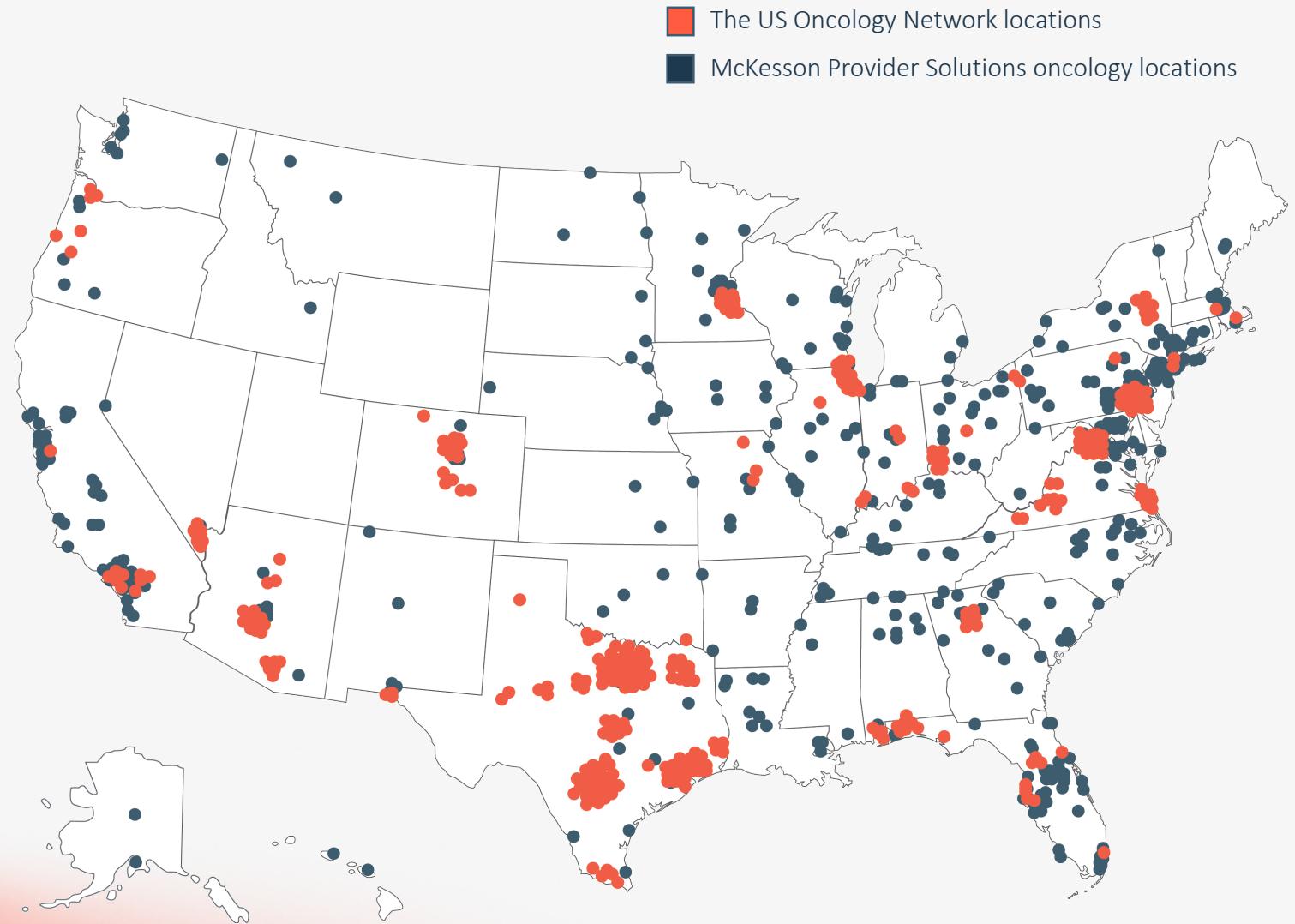


Ontada is helping define & standardize methodologies alongside life sciences & Friends of Cancer Research

We're uniquely positioned to advance cancer care by leveraging our interconnected technology & insights

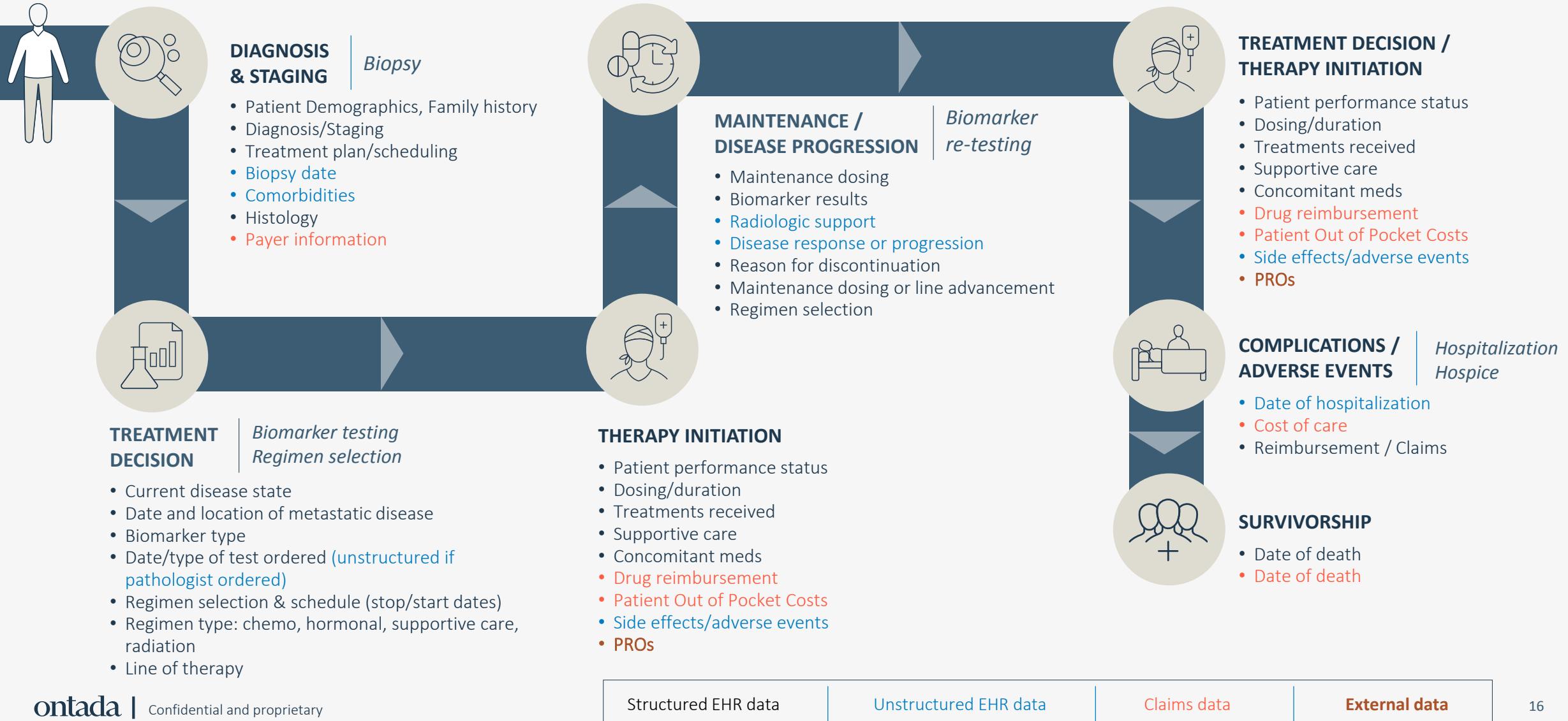


Our broad reach creates meaningful opportunities to engage with providers



Traditional Endpoints

Data enhancements on top of our structured clinical and genomic data elements give you the clearest view into the full patient journey



Our EHR supports providers in delivering the leading evidence-based care, while also capturing structured clinical data at the point-of-care



Screenshot of the iKnowMed Generation 2 EHR interface showing the "Clinical Profile" section for patient Lucia Moura (30 / F). The "Problems Beta" tab is selected.

New Problem

Problem (required): **Breast cancer, female**

Date of Diagnosis: **01/11/2021**

Status: **Active**

Comment:

Details: Stage Date : 01/18/2021, Ordinal : Primary, Staging Type : Clinical, Location : Left breast upper-outer quadrant

ICD-10: HCC C50.412 - Malignant neoplasm of upper-outer quadrant of left female breast

Staging

Add a Stage

Stage Date	01/18/2021
Ordinal	Primary
Staging Type	Clinical
Location	Left breast upper-outer quadrant
Tumor Type	
Node	
Metastasis	
Grade-Nottingham	
ER Status	
PR Status	

Location

- Left breast upper-inner quadrant
- Left breast upper-outer quadrant
- Left breast lower-inner quadrant
- Left breast lower-outer quadrant
- Left breast nipple and areola
- Left breast central portion
- Left breast axillary tail
- Left breast overlapping sites
- Left breast unspecified site
- Right breast upper-inner quadrant
- Right breast upper-outer quadrant
- Right breast lower-inner quadrant
- Right breast lower-outer quadrant
- Right breast nipple and areola

Buttons: SAVE & ADD ANOTHER, SAVE & CLOSE, CANCEL, NEXT

Our integrated clinical decision support tool helps providers to deliver on the promise of precision medicine



Edit Patient Problem

Histopathologic Type

- Squamous cell carcinoma
- Adenocarcinoma
- Adenocarcinoma, Minimally invasive
- Adenocarcinoma, Predominantly invasive
- Adenocarcinoma, Invasive
- Adenocarcinoma, Lepidic
- Adenocarcinoma in situ
- Adenosquamous carcinoma
- Bronchoalveolar carcinoma
- Large cell carcinoma
- Sarcomatoid carcinoma
- Neuroendocrine carcinoma
- Mixed cell type
- Other
- Unknown

ROS1 Gene

- Positive
- Negative
- Unknown

BRAF Mutation

- BRAF V600E (Mutated)
- Wild-type
- Mutations
- Unknown

PD-L1

- >= 50% (Positive)
- 1-49% (Intermediate)
- Negative
- Unknown

EGFR Expression

- Positive-EGFR sensitizing mutation
- Positive-EGFR non-sensitizing mutation

Histologic Grade

- GX
- G1

Tumor Size (cm)

Residual Tumor

- R0
- R1

Clear Value Plus - Pathway Decision Support

Test1a Patient1a (50 / M)

MRN: test1a
DOB: 01/01/1970
Insurance:

<input checked="" type="checkbox"/> ALK (FISH):	Positive	
<input checked="" type="checkbox"/> BRAF Mutation:	Wild-type	
<input checked="" type="checkbox"/> EGFR Expression:	Negative	
<input checked="" type="checkbox"/> MET gene status:	MET negative	
<input checked="" type="checkbox"/> TRK gene:	Negative	
<input checked="" type="checkbox"/> PD-L1:	Negative	
<input checked="" type="checkbox"/> RET gene fusion status:	RET fusion negative	
<input checked="" type="checkbox"/> ROS1 Gene:	Negative	

Search All Regimens

= Used by decision support

SAVE CANCEL

New enhancements make it even easier for providers to select and order the right testing, supporting our growing precision medicine data set

Biomarker Lab Ordering Tool

POPPI FLOWER (43/F) DOB: 7 Jul 1977

Diagnosis: Breast Cancer ▾

Order biomarker panel(s)

No tissue remaining (For Germline BRCA mutations (PARPi))

ORDERS Refer to Genetic Counseling

Sufficient tissue for further testing

Early invasive breast cancer recurrence risk

Metastatic HER2 negative

Metastatic triple negative

ORDERS

BIOETHERANOSTICS BCI

MAMMAPRINT

ONCOTYPE DX

ORDERS

CARIS MI PROFILE

CARIS MI TUMOR SEEK

PARADIGM NGS

PARADIGM PCDX

ORDERS

CARIS MI PROFILE

CARIS MI TUMOR SEEK

PARADIGM NGS

PARADIGM PCDX

ORDERS

FOUNDATION MEDICINE LIQUID

GUARDANT 360

Refer to Genetic Counseling

Refer to Genetic Counseling

STANDARD PATHOLOGY FORM

ADDITIONAL INFO

Send comments or questions to: biomarker@mckesson.com

ORDER FORM

The screenshot shows a user interface for a biomarker lab ordering tool. At the top, patient information is displayed: POPPY FLOWER (43/F) DOB: 7 Jul 1977, and a diagnosis of Breast Cancer is selected. The main area contains a flowchart for ordering biomarker panels. On the left, a section for 'No tissue remaining (For Germline BRCA mutations (PARPi))' leads to 'ORDERS Refer to Genetic Counseling'. In the center, a section for 'Sufficient tissue for further testing' branches into three categories: 'Early invasive breast cancer recurrence risk', 'Metastatic HER2 negative', and 'Metastatic triple negative'. Each category has its own set of 'ORDERS' buttons for various tests like BIOETHERANOSTICS BCI, MAMMAPRINT, ONCOTYPE DX, CARIS MI PROFILE, CARIS MI TUMOR SEEK, PARADIGM NGS, PARADIGM PCDX, FOUNDATION MEDICINE LIQUID, and GUARDANT 360. A callout box highlights the 'Breast Cancer' diagnosis. At the bottom, there are links for 'ADDITIONAL INFO' and 'ORDER FORM'.

iKnowMed Data Points – Stage at Diagnosis

Stage at Diagnosis G1

The screenshot shows the iKnowMed G1 interface. At the top, the patient's name is TEST, PAUL, and the ID is PATIENTID: 162464 DOB: 10/15/1944. The menu bar includes File, View, Chart, Regimen, Window, Help, Decision Tools, View, and Order Rx. The main window displays the Primary Hem/Onc Diagnosis for this visit, which is Breast. Under Tumor characteristics, it shows TNM staging: T1c N1 M1b, Staging type: Pathological, Location: Lung, left, and Stage at diagnosis: IV A. A red box highlights the 'Stage at diagnosis' field. Other sections include Allergies / Adverse Reactions, Patient status alerts, and various laboratory and imaging results.

Stage at Diagnosis G2

The screenshot shows the iKnowMed G2 interface. The title is Edit Patient Problem for Female breast cancer. It includes fields for ICD 10 (C50.011 - Malignant neoplasm of nipple and areola, right), Status (Active), Date of Diagnosis, Resolution Date, and Notes. Below these are sections for Extent of Disease (Active surveillance, Adjuvant, Evidence of local disease, Evidence of metastatic disease, Unknown) and Other. A detailed Staging table is shown with fields for Stage Date (12/04/2017), Ordinal (Primary), Staging Type (Pathological), Location (Left breast nip), Tumor Type (T2), Node (pN1), Metastasis (M1), Stage (IV), and Stage At Dx (checkbox). Buttons for Save, Cancel, and Remove are at the bottom. Other sections include Disease State (Initial diagnosis, Stable disease, Recurrent disease) and Lymph Node Involvement (Lymph nodes, Axillary, Brachial, Bronchopulmonary).

iKM Data Points- Disease Status

Current Disease Status G1

Screenshot of the iKnow! EMR software interface. The main window shows a patient summary for ZZTEST, CINDY, with the patient ID TR7777 DOB: 08/15/1975. The 'Allergies / Adverse Reactions' tab is selected. On the left, a sidebar lists various medical history sections like 'Office visit', 'Colon Cancer', 'Tumor characteristics', etc. The 'Tumor characteristics' section is expanded, showing TNM staging (T1 N1a M1a, Staging type: Patho...), Node positive disease, Stage at Diagnosis (IIIA), and Location (Transverse colon). The 'Primary Hem/Onc Diagnosis for this visit' panel is open, displaying 'Colon Cancer' under the 'Digestive System' category. Other categories shown include Breast, Cardiovascular, CNS, Endocrine/Metabolic, Genitourinary, and Gynecologic. A dropdown menu for 'Evidence of Metastatic disease' is also visible.

Current Disease Status G2

Screenshot of the 'Edit Patient Problem' dialog box. The search bar contains 'Female breast cancer'. The 'Principal diagnosis' section shows ICD 10 code C50.011 - Malignant neoplasm of nipple and areola, right female. The 'Status' dropdown is set to 'Active'. The 'Extent of Disease' section includes options for Active surveillance, Adjuvant, Evidence of local disease (selected), Evidence of metastatic disease, and Unknown. The 'Other' section is collapsed. The 'Staging' table shows the following details:

Stage Date	Ordinal	Staging Type	Location	Tumor Type	Node	Metastasis	Stage	Stage At Dx
12/04/2017	Primary	Pathological	Left breast nip	T2	pN1	M1	IV	IV

The 'Disease State' section includes options for Initial diagnosis, Stable disease, and Recurrent disease. The 'Lymph Node Involvement' section includes Lymph nodes, Axillary, Brachial, and Bronchopulmonary. The bottom right of the dialog has 'SAVE' and 'CANCEL' buttons.

iKM Data Points – Line of Therapy

Line of Therapy G1

Order Regimen -- Webpage Dialog

Type: Direct On Behalf Of: [redacted] This practice only All practices

Patient Information: Diagnosis: Colon Cancer Stage: IVA Current Status: [redacted]

Line of Therapy: [redacted]

Height - in (new): [redacted] Weight - lbs (new): [redacted] BSA - m²: [redacted] Dubois

Regimen: Fluorouracil (Leu) + CIV + Oxaliplatin (FOLFOX 6, Modified)

Give	Order	Dose	Calc. Dose	Schedule	Instructions
Give	Order	Dose	Calc. Dose	Schedule	Instructions
<input type="checkbox"/>	<input type="button" value="Add New"/>				
IV access					
Regimen Instructions					
CHEMOTHERAPY <input type="button" value="Add New"/>					
<input type="checkbox"/>	Oxaliplatin, inj	85 Mg/M2 IVPB as directed		D1	Mix in 250 mL D5W. Not compatible with NS. Oxaliplatin is an irritant.
<input type="checkbox"/>	Leucovorin calcium, inj	400 Mg/M2 IVPB as directed		D1	Mix in 250 mL NS or D5W.
<input type="checkbox"/>	Levoleucovorin calcium, inj	200 Mg/M2 IVPB as directed		D1	Mix in NS or D5W. May be diluted to concentrations of 0.5 mg/mL to 5 mg/mL. Total dose equals 50% of leucovorin dose. Refer to drug stability guidelines for agent.
<input type="checkbox"/>	Fluorouracil, inj	400 Mg/M2 IV Push as directed		D1	
<input type="checkbox"/>	Fluorouracil CIV, inj	2400 Mg/m ² over 46 hrs CIV as directed		D1	TOTAL CIV CYCLE DOSE = 2400 mg/m ² CIV over 46 hours. Patient to be seen for a pump disconnect on Day 3. Refer to drug stability guidelines.
PREMEDICATIONS <input type="button" value="Add New"/>					
<input type="checkbox"/>	Palonosetron hcl, inj	0.25 mg as directed I.V.		D1	
<input type="checkbox"/>	Granisetron hcl, inj	1000 mcg as directed I.V.		D1	
<input type="checkbox"/>	Granisetron hcl, po solid	2 mg PO Daily (Tablet(s))		D1	
<input type="checkbox"/>	Granisetron hcl, po solid more...	2 mg PO Daily PRN (Tablet(s))		Rx	
<input type="checkbox"/>	Granisetron, top	1 Patch Topical as directed (Patch(es))		Rx	24 hours before chemotherapy. Dosing not to exceed 7 days.

Line of Therapy G2

Clear Value Plus - Pathway Decision Support

Posey Flower (43 / F) Clear Value Plus SM

Powered by NCCN

Line of Therapy:

1st Line Metastatic or Recurrent

2nd Line Metastatic

3rd Line Metastatic

4th Line Metastatic

5th Line Metastatic

6th Line Metastatic

7th Line Metastatic

8th Line Metastatic

9th Line Metastatic

10th Line Metastatic

Fill in missing
Please supply the following concordance:

LINE OF THERAPY

Regimen Type: Regimen Type:

Other Factors

Node:

Metastasis:

Ordinal:

Location: Left breast nipple and areola

Diagnosis

Primary Diagnosis: Malignant neoplasm of female breast (disorder)

Staging Information

Tumor Type: T2

Value Pathways	NCCN	P&T Preferred	NCCN Category of Evidence	Febrile Neutropenic Risk	Emetogenic Risk	Action
Value Pathways	NCCN	P&T Preferred	NCCN Category of Evidence	Febrile Neutropenic Risk	Emetogenic Risk	Action

Challenges

- Date of death concordance
 - Presentation in March from Flatiron Health perfectly describes
 - We evaluated 102911 patients using structured data and a subset of 826 patients were using unstructured data¹.
 - Among patients with death dates reported by either structured data or DMF (n=36,941), 93.3% were captured by structured data, with DMF providing dates for an additional 6.7%.
 - Among patients with dates reported by both structured data and DMF (14.9%), concordance was 88.0%.
 - Among subset of patients with unstructured data (n=358), 99.4% of death dates were captured from structured and unstructured data, with DMF providing dates for an additional 0.6%. Death dates were reported by all three sources for 16.2% with concordance of 94.8%.
 - Work to do:
 - Loss to follow up
 - Condolence cards
 - Survivorship programs

Challenges

- Line of Therapy
 - Concordance of Clinical Vs. Algorithm Based Line of Therapy Determination in Lung Cancer²
 - 150 patients with SCLC, 148 initiated 1L by both structured and unstructured data (98.6% percentage-agreement); all reported the same regimen (100% percentage-agreement).
 - By algorithm and clinical inputs, 33 patients initiated 2L having identical regimens (kappa-statistic: 0.81, 95%CI: 0.69-0.92). There were 11 discordant patients for 2L: 1 and 10 patients by unstructured and structured data, respectively.
 - Of the 150 patients with NSCLC, 147 initiated 1L by both structured and unstructured data (98% percentage-agreement); 135/147 reported the same regimen (91.8% percentage-agreement).
 - By algorithm and clinical inputs, 29 patients initiated 2L having identical regimens (kappa-statistic: 0.56, 95%CI: 0.42-0.70). There were 27 discordant patients for 2L: 4 and 23 patients by unstructured and structured data, respectively.
 - Work to do:
 - Data source matters
 - Doctors are people too

Contemporary Endpoints

iKM Data Points – Performance Status

Performance Status G1

Surgery

Ovarian epithelial cancer Completed treatment details

Service History
Prior Observations
My Preferences

Surgery TAH, BSO, omentectomy (b/o) [Date: 2/1/2010; Phase of treatment: Initial with Palliative intent, Response: Margins Negative.]

Chemotherapy
Radiotherapy
Procedure
Other

TAH, BSO, omentectomy (b/o)

TAH, BSO, omentectomy, debulking with no visible residual mass (b/o)

TAH, BSO, omentectomy, debulking with <= 2cm residual disease (b/o)

TAH, BSO, omentectomy, debulking with > 2cm residual disease (b/o)

Secondary debulking (b/o)

Bilateral salpingo-oophorectomy (b/o)

Unilateral salpingo-oophorectomy (b/o)

Text Entry

iknowMed Dictation

Performance Status G2

Add Performance Status

Observation Date :* 10/01/2020 Scale :* Select One... Select One...

ECOG
Karnofsky

Add Performance Status

Observation Date :* 10/01/2020 Scale :* ECOG

- 0 Normal activity. Fully active, able to carry on all pre-disease performance without restriction.
- 1 Symptoms, but ambulatory. Restricted in physically strenuous activity, but ambulatory and able to carry out work of a light or sedentary nature (e.g., light housework, office work).
- 2 In bed <50% of the time. Ambulatory and capable of all self-care, but unable to carry out any work activities. Up and about more than 50% of waking hours.
- 3 In bed >50% of the time. Capable of only limited self-care, confined to bed or chair more than 50% of waking hours.
- 4 100% bedridden. Completely disabled. Cannot carry on any self-care. Totally confined to bed or chair.
- 5 Dead.

SAVE CANCEL

iKM Data Points - Pain

Pain G1

Nurse Note *

Patient status alerts

Primary Charting

Clinic note

Anticoagulation program note

Patient assessment

Pregnant at diagnosis

Menopausal status Postmenopausal

Karnofsky performance status 90% - Able to carry on normal ac...

NCI toxicities

Edmonton Symptom Assessme...

Nursing procedures

Patient education

Discharge note

Other Charting

Incident to

Phone note

Message

Vital signs *

Weight

Height 67 in (170 cm)

Blood pressure

Pulse

Respiration

Temperature

Sequential vital signs

Orthostatic vital signs

Pain scale (0-10)

O₂ sat

IVCS Vital signs

2 d meds

Save Note **4 Discard**

Pain scale (0-10)

Best since last visit

Service History
Prior Observations
My Preferences

Current 4; Best since last visit Worst since last visit

0: No pain 1: 2: 3: 4: 5:

Text Entry **3**

Pain scale (0-10)

Previous **Next**

Pain G2

Daily Vitals for 10/01/2020 - (F, DOB: 07/07/1977, ID: zzflowerposey) **required**

Height (in): BSA: m² (DuBois And DuBois)
Last height 64 in on 11/19/2018

use last value

Temperature (F): + Add comment

Source

Pulse (BPM): + Add comment

+ Add another Source Position

Respirations (/min): + Add comment

Blood Pressure (mm Hg): + Add comment

SBP / DBP (0=pulse) Position Cuff size

+ Add another

Pain Scale: + Add comment

Select One
N/A
0-No pain
1
2
3
4
5
6
7
8
9

Room air Nasal cannula L/min Flow rate

+ Add comment

iKM Data Points - Depression

Depression G1

Depression screening Service History
Depression screen Prior Observations
My Preferences

Depression screening
Depression screen
Depression screen outcome

Depression screening : Yes Service History
Screening tool used Prior Observations
My Preferences

Yes Screening tool used

Yes: adult Yes: adolescent 4

Beck Depression Inventory (BDI)
 Center for Epidemiologic Studies Depression Scale (CES-D)
 Cornell Scale Screening
 Depression Scale (DEPS)
 Duke Anxiety-Depression Scale (DADS)
 Geriatric Depression Scale (GDS)
 Patient Health Questionnaire (PHQ-9)
 PRIME MD-PHQ2
 Other

Depression G2

Edit Depression Status * required

Observation Date: 09/28/2020

Patient was screened for depression?

Yes Screening tool used: Patient Health Questionnaire (PHQ9)

No Reason: Select

Outcome positive (patient is depressed)?

Yes
 No

Total Depression Score: 20

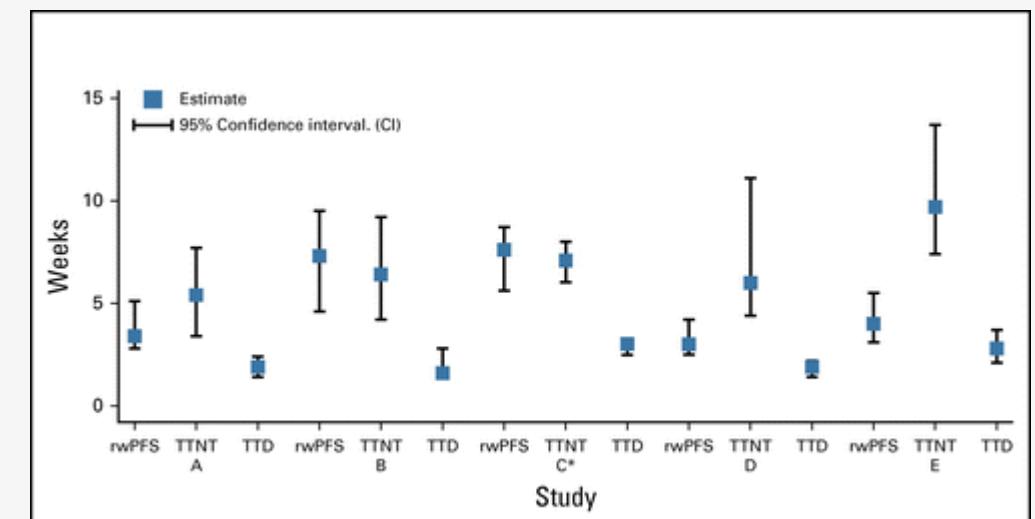
Plan:

Additional evaluation for depression
 Suicide Risk Assessment
 Referral to a practitioner who is qualified to diagnose and treat depression
 Pharmacological interventions
 Other interventions or follow-up for the diagnosis or treatment of depression
 Patient declined treatment

SAVE **CANCEL**

Challenges

- Progression
 - Comparisons of Real-World Time-to-Event End Points in Oncology Research³⁻⁵
 - Across all studies, median TTD durations were shorter than median rwPFS and TTNT durations, with 95% CIs overlapping just once among the measures.
 - The 95% CIs for TTNT and rwPFS overlapped for three of the five studies, but the 95% CIs for TTNT were greater than rwPFS in the remaining two studies.
 - When expressed as point estimate ratios between surrogate measures and rwPFS, TTD or rwPFS ranged from 0.22 to 0.70 while TTNT or rwPFS ranged from 0.88 to 2.43. Additionally, the available samples to analyze TTD and TTNT were larger than for rwPFS.
 - Work to do:
 - Data source matters
 - Doctors are people too, again
 - RECIST in practice is not practical



Future Endpoints

We have access to lab and genomic test results in both structured and unstructured formats

Date of Birth: 00/00/0000
PCDx Case#: PCDx-19-00000
Physician: Dr. Smith
Facility: Some Cancer Treatment Center

Case/Specimen ID: AA00-00000 A0
Collection Site: Liver
Collection Date: 00/00/0000
Received for testing: 00/00/0000

5 actionable genomic findings

- APC R232*
- APC E941*
- FANCA T1131A
- KRAS G12D
- TP53 P190L

Additional Findings: BRAF Wildtype, NRAS Wildtype, PIK3CA Wildtype

Immunotherapy TMB: Low (7 muts/mb)

6 therapies with potential increased benefit

Irinotecan*	NCCN	TOPO1
Regorafenib*	NCCN	KRAS, NRAS
Temozolomide*		MGMT
Binimetinib		KRAS
Carmustine		MGMT
Topotecan		TOPO1

* Indicates associations supported by the highest level of evidence

Tumaround: 3 business days
Tumor cells: 70%
Specimen size: 15 mm²
Requirement met: Optimal

6 IHCs

HER2 Negative	MGMT Negative
PDL1:TILs Negative	PDL1:Tumor Negative
PTEN Positive	TOPO1 Positive
TRKpan Negative	

SUMMARY OF BIOMARKER RESULTS (SEE APPENDIX FOR FULL DETAILS)

Biomarker	Method	Result	Biomarker	Method	Result
	NGS	Mutation Not Detected	KDR (VEGFR2)	NGS	Mutation Not Detected
	NGS	Quantity Not Sufficient	KRAS	NGS	Mutation Not Detected
	NGS	Mutation Not Detected	MGMT	IHC	Negative
Gen Receptor	IHC	Negative	MPL	NGS	Mutation Not Detected
	NGS	Mutation Not Detected	NOTCH1	NGS	Mutation Not Detected
	NGS	Mutation Not Detected	NPM1	NGS	Mutation Not Detected
	NGS	Mutation Not Detected	NRAS	NGS	Mutation Not Detected
	PD-1 IHC	Negative	PDGFRA	NGS	Mutation Not Detected
	NGS	Mutation Not Detected	PD-L1 IHC	IHC	Negative
	NGS	Mutation Not Detected	PGP	IHC	Negative
	CISH	Test Not Performed	PIK3CA	NGS	Mutation Not Detected
	IHC	Negative	PP	IHC	Negative
	NGS	Mutation Not Detected		IHC	Positive
	NGS	Mutation Not Detected		NGS	Mutation Not Detected
	NGS	Mutation Not Detected		NGS	Mutation Not Detected
	FISH	Negative		IHC	Negative
	IHC	Negative		NGS	Mutation Not Detected
	NGS	Mutation Not Detected		NGS	Mutation Not Detected
	NGS	Quantity Not Sufficient		IHC	Negative
	IHC	Negative		NGS	Mutation Not Detected
	NGS	Mutation Not Detected		IHC	Positive

Summary of Somatic Alterations & Associated Treatment Options

KEY ✓ Approved in indication ~ Approved in other indication ✗ Lack of response

Alteration	% cfDNA or Amplification	Associated FDA-approved therapies	Clinical trial availability (see page 3)
EML4-ALK Fusion	0.9%	✓ Crizotinib, Ceritinib, Alectinib	Yes
PTEN A333fs	0.2%	~ Temsirolimus, Everolimus	Yes
MYC Amplification	Medium (++)	None	Yes

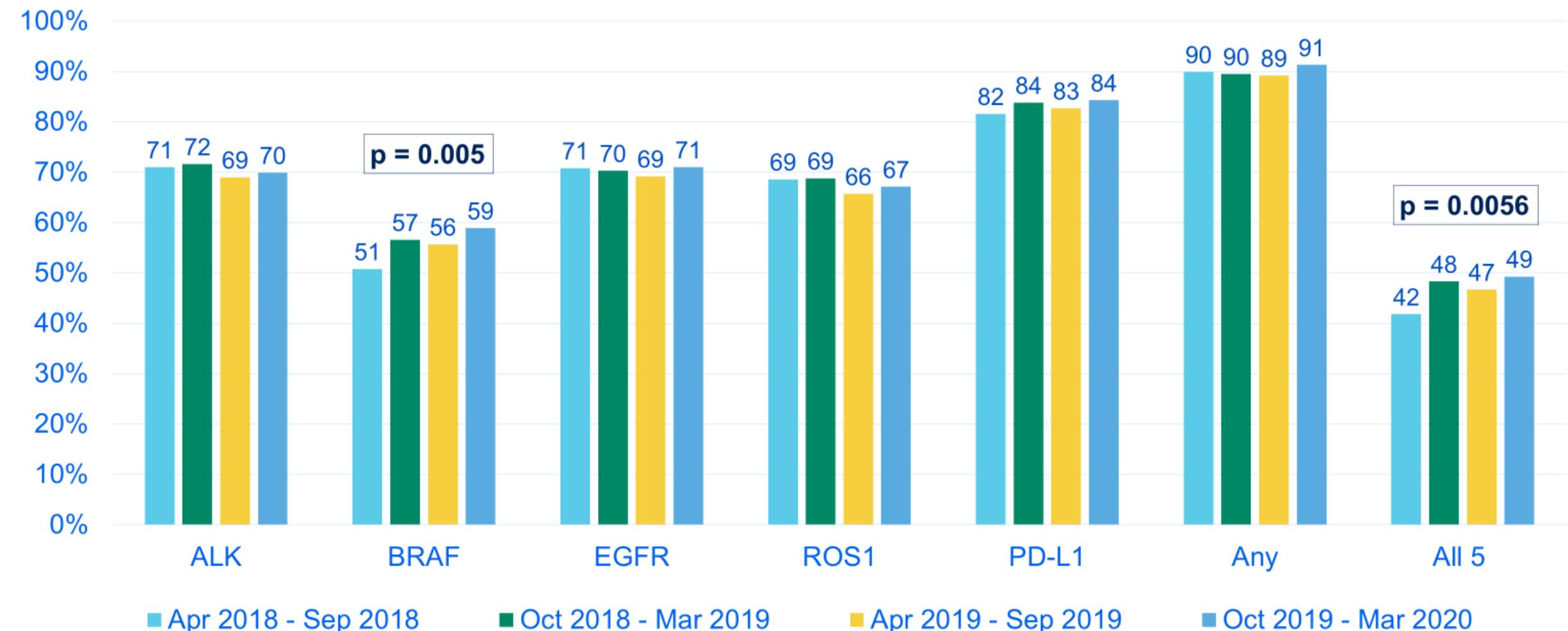
Variants of Uncertain Significance
MAP2K1 G80C (1.4%), EGFR S246R (1.3%), BRAC2 Q1507P (0.8%)
The functional consequences and clinical significance of alterations are unknown. Relevance of therapies targeting these alterations is uncertain.

Synonymous Alterations
MET S286S (0.8%)
This sequence change does not alter the amino acid at this position and is unlikely to be a therapeutic target. Clinical correlation is advised.

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Biomarker testing rates over time



iKM Data Points – Genomic data

This real-world study showed that most patients received at least one biomarker test prior to 1L; however, <50% of patients received all 5 tests

- NGS testing increased over time, suggesting that comprehensive testing is increasing
- Median time from diagnosis to 1L therapy was about 5 weeks and turn around time from testing orders to results about 2 weeks.
- Results were similar for the overall study population and for patients with nonsquamous histology

Data from this phase will be compared to the next phase of the MYLUNG study, which will evaluate contemporary ordering practices and turnaround times prospectively.

iKM Data Points – Adverse Events

Screenshot of the iKnowMed Generation 2 application interface showing the "Add Adverse Event" form.

The form is titled "Add Adverse Event" and includes the following fields:

- CTCAE Version:** Radio buttons for 5.0 (selected), 4.03, 4.0, and 3.0.
- Common Toxicities Quick Select:** A dropdown menu showing "anxi" and "Anxiety".
- Type:** A dropdown menu showing "anxi" and "Anxiety".
- Grade:** A dropdown menu showing "--Please Select--".
- Onset Date:** A date input field set to 01/04/2017.
- Resolution Date:** A date input field set to 01/06/2017.
- Related to Study Drug:** A dropdown menu showing "--Please Select--".
- Most likely related to:** A dropdown menu showing "--Please Select--".
- Medication:** A dropdown menu labeled "Search Orderables" showing treatment-related options.
- Action taken:** A dropdown menu showing treatment-related actions.
- Comments:** A text area for comments.

At the bottom of the form are "SAVE" and "CANCEL" buttons.

Measure what you treasure

You can't measure or analyze what was never collected

- People (doctors, patients, etc,) are responsible for the entry of these data

Do we need to rethink our most often used endpoints

- Patient-centric views
- What really matters

Broader industry adoption of methods and measurements

- Friends of Cancer
- ISPOR/ISPE

Thoughts for Sentinel

A few more thoughts

Data collection in the hands of the patient

- Real time symptom monitoring
- New patient reported outcomes (even better if patterned after those collected in trials)

Training

- Adverse events aren't what they used to be
- I/O therapy
- Cell and gene therapy

Thank You!

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Illustrative Example

NSCLC
EGFR-Positive

