

CELEBRATING 20 YEARS

20

Guidelines
International
Network

GIN Guidelines
International
Network

Visualising data-driven decision algorithms for consulting clinical practice guidelines

GIN Conference 2022

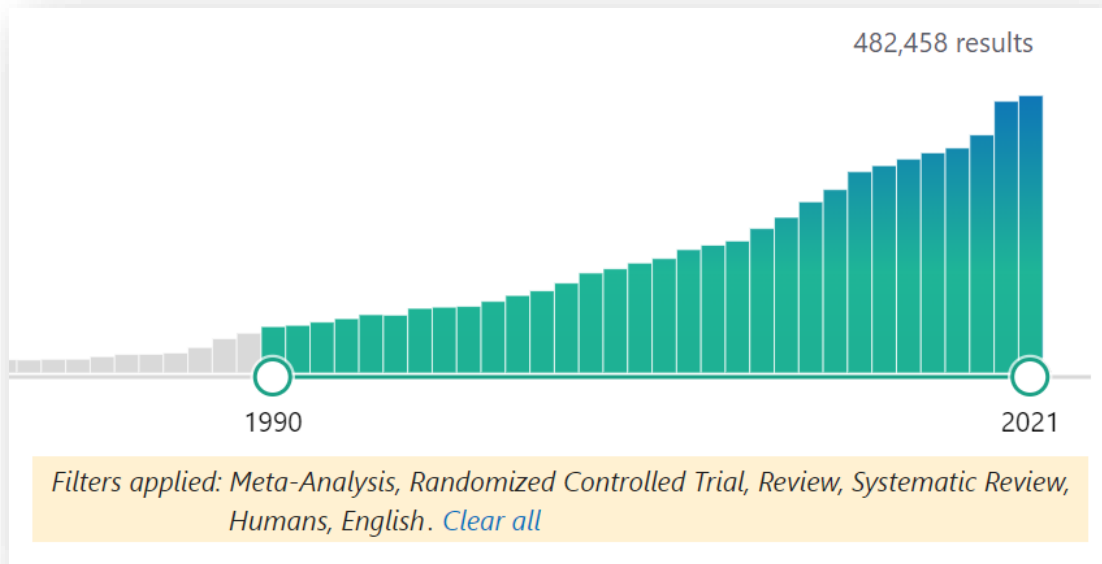
21 – 24 September 2022
The Westin Harbour Castle, Toronto

Thijs van Vegchel

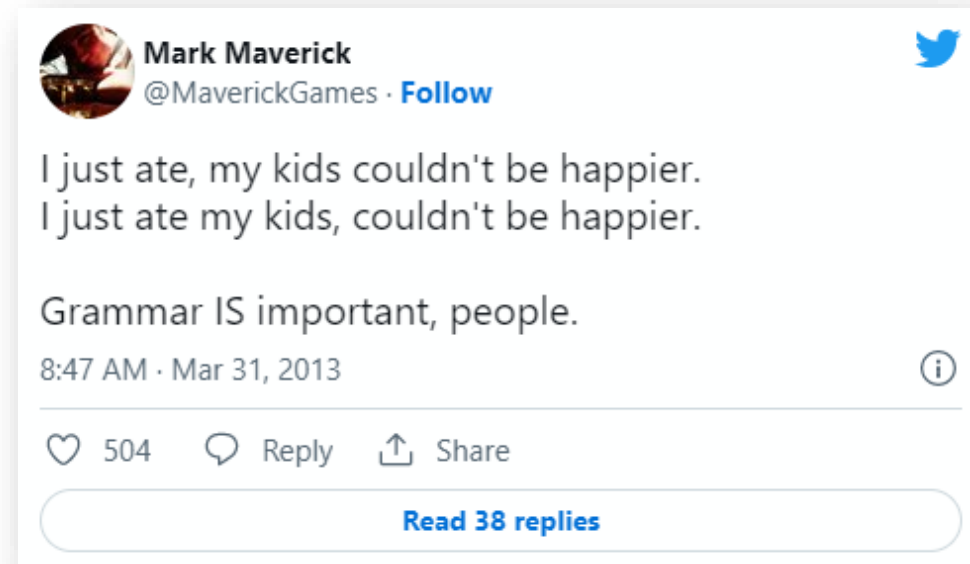
Netherlands Comprehensive Cancer Organisation

Local Host
McMaster
University 

Problem statement



PubMed search on Breast Cancer
On average 36 new publications daily



Textual guidelines vs decision algorithms

Findings

Textual guidelines are soo 2010s

Guideline recommendations are often intertwined in large cumbersome texts divided over different modules

The image shows a page of handwritten medical notes with several yellow callout boxes pointing to specific areas of text. The notes are written in Dutch and include terms like 'Contra-indicaties voor MST', 'Wens van patiënte voor mastectomie', and 'Locoregionale radiotherapie'. The callout boxes contain the following text:

- Contradictory recommendations**: Points to a section titled 'Contra-indicaties voor MST'.
- When?**: Points to a section discussing 'Wens van patiënte voor mastectomie'.
- Is this part of this chapter?**: Points to a section discussing 'Okselklierdisse'.
- Always?**: Points to a section discussing 'Locoregionale radiotherapie'.
- Different definitions on different pages**: Points to a section discussing 'Stadium III'.
- Now or never?**: Points to a section discussing 'Stadium III'.

Handwritten notes also include phrases like 'komt niet alleen met conclusie 3 p196?', 'aan bij MastX', 'dit is een andere stadium III omschrijving dan op p 186', and 'deels dubbel'.



Textual guidelines vs. Clinical Decision Trees

Increasing amount of subpopulations

No longer possible for any human to know every subpopulation

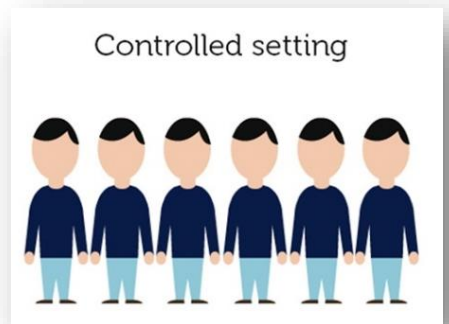
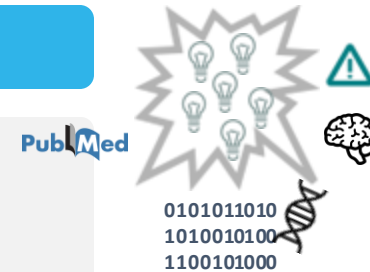
- Specific subpopulations 40 year old premenopausal, pregnant female with grade 2 pT1cN1M0, HR negative, HER2 positive invasive breast cancer, without angioinvasion, but with 2 positive axillary nodes who has undergone breast conserving surgery

Even if age is divided into 10-year cohorts, this results in 7.2 million (10X2x2x3x3x16x4x2x2x2x2x2x5x2) subgroups

Recommendations are based on study populations.

Clinical Decision Trees based on Information Standards can help

Combining Clinical Decision Trees with Real World Data is even better



Textual guidelines vs. Clinical Decision Trees

Text

*If extra-uterine disease is suspected:
serum CA125*

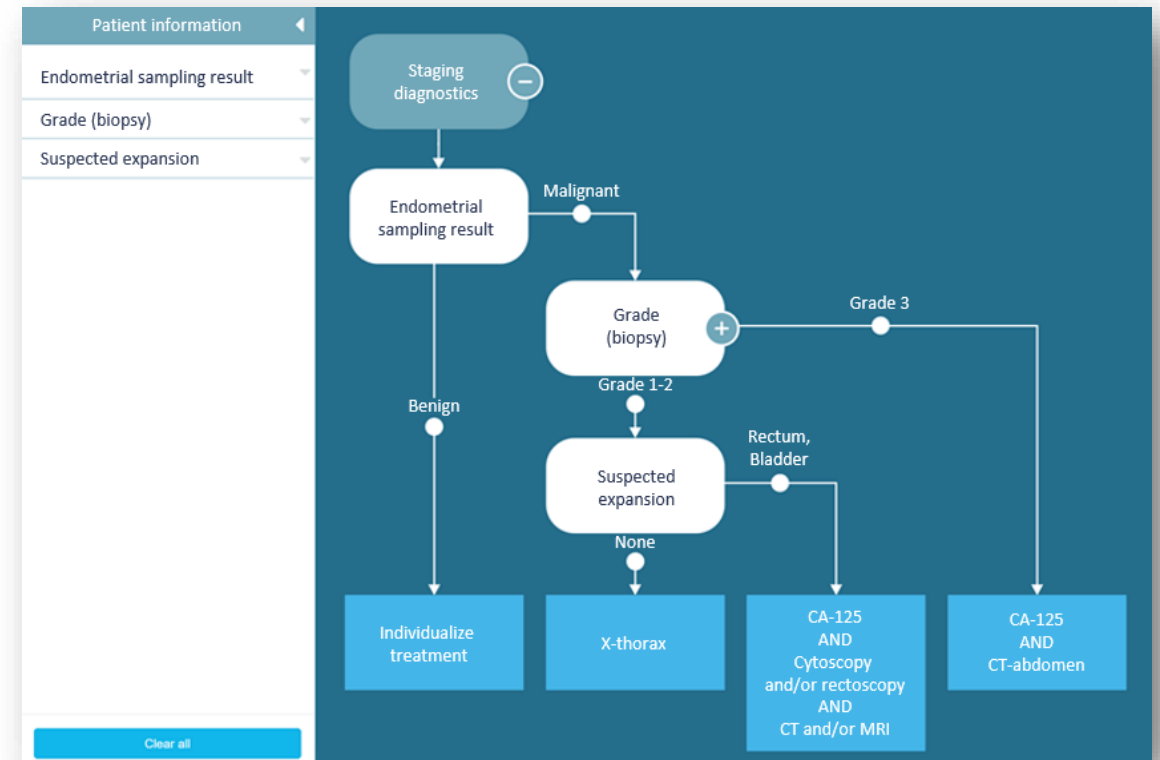
*It has been shown that of the imaging techniques
(MRI, CT scan, PET scan), MRI has the best predictive
value for determining myometrial invasion, especially
when contrast-enhancing agents are used.*

Basic imaging

- transvaginal ultrasound (see related)
- chest x-ray
- cystoscopy/rectoscopy if complaints and/or symptoms give cause for this

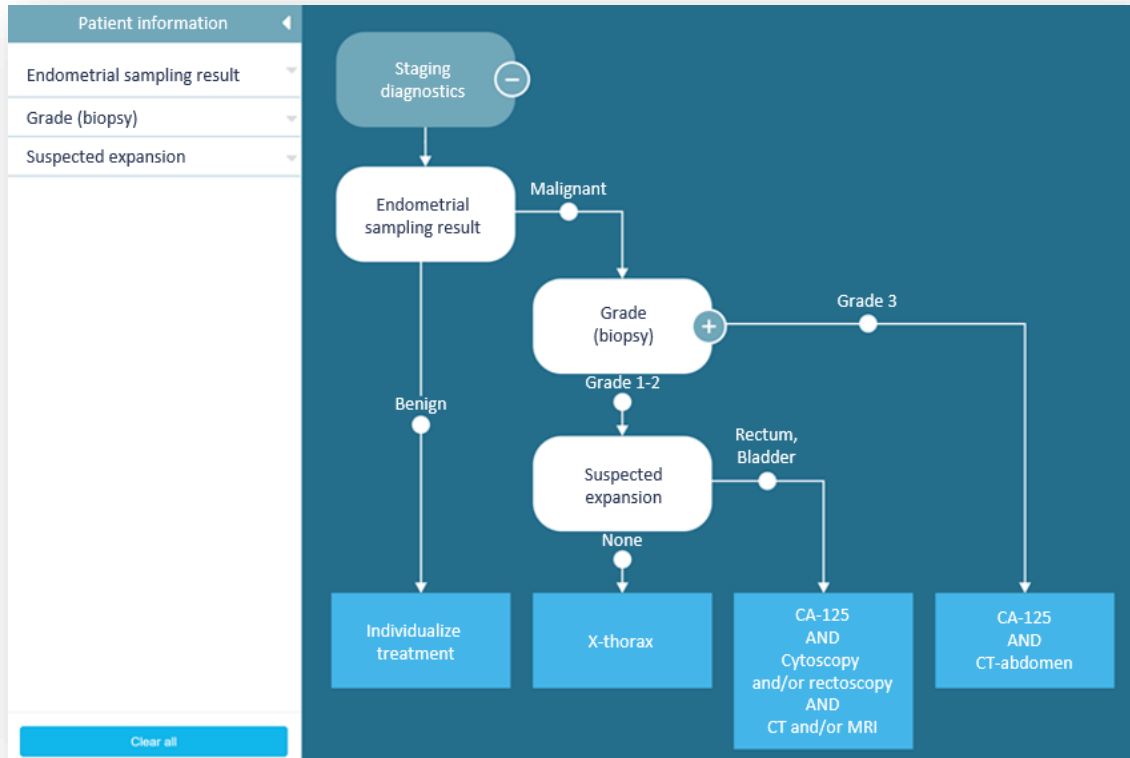
*Do not routinely perform a CT scan of the
abdomen in women with suspected low-stage
low-grade endometrial cancer.*

Clinical Decision Tree

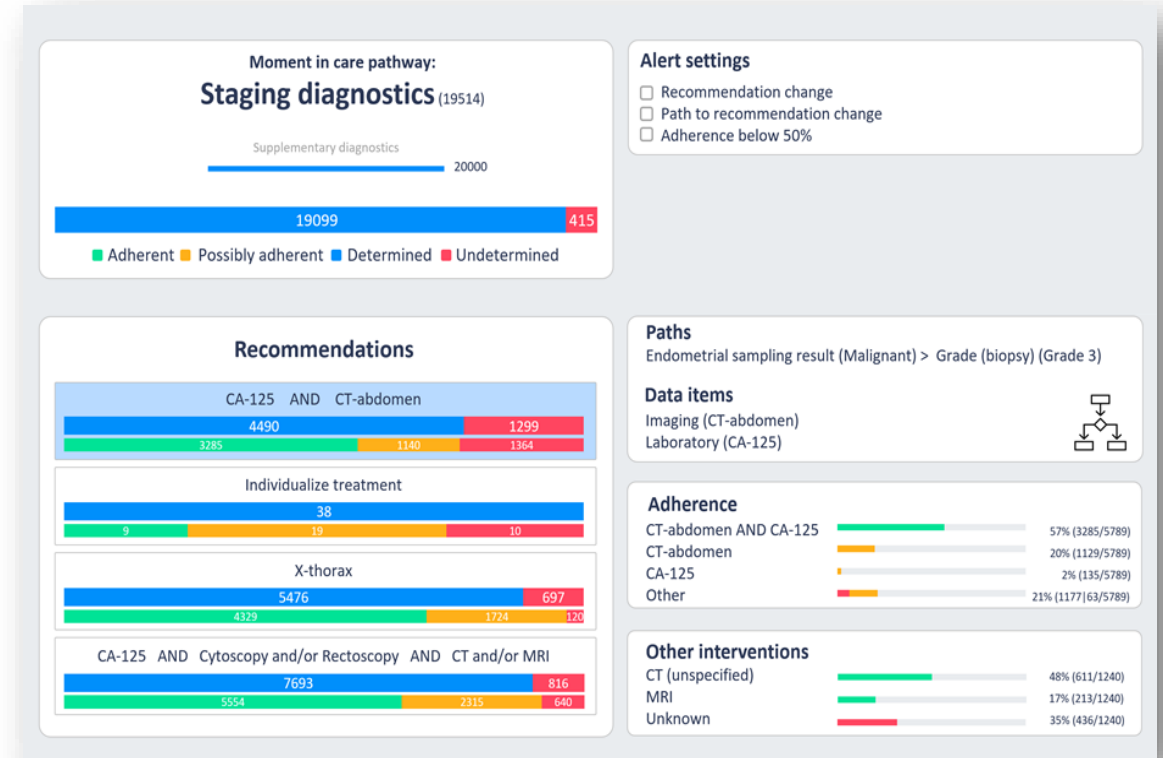


Clinical Decision Trees vs. Dashboard

Clinical Decision Tree



Dashboard



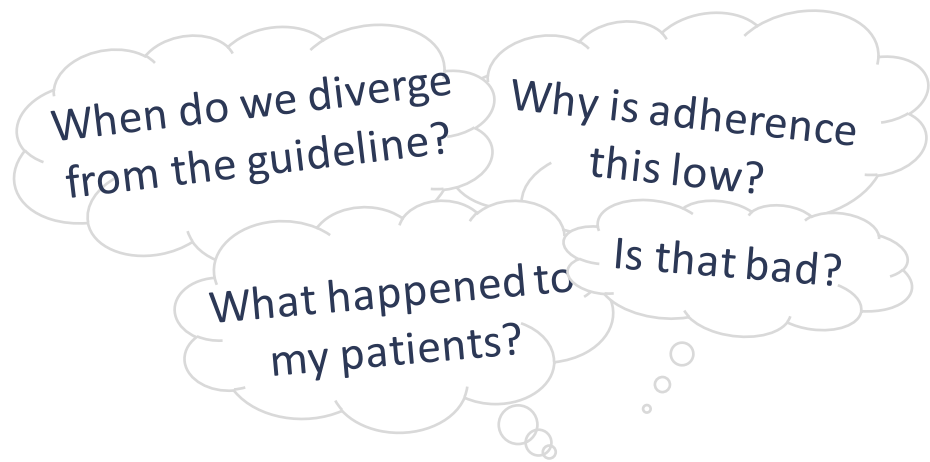
Alertness Project



Structural signaling for up-to-date guidelines

Automatic alert when there are developments in:

- **Science** caught by frequent updates of NCCN® guideline
- Treatment **practice**, trapped in the NCR



Visualising data and recommendations

CDTs based on CPGs



Recommendations

CA-125 AND CT-abdomen

Individualize treatment

X-thorax

CA-125 AND Cytoscopy and/or Rectoscopy AND CT and/or MRI

Integrated in EHR



Recommendations

CA-125 AND CT-abdomen

Individualize treatment

Paths
Endometrial sampling result (Malignant) > Grade (biopsy) (Grade 3)

Data items
Imaging (CT-abdomen)
Laboratory (CA-125)

Enriched with RWD



Recommendations

CA-125 AND CT-abdomen

4490	1299
3285	1364

Individualize treatment

Adherence

CT-abdomen AND CA-125	57% (3285/5789)
CT-abdomen	20% (1129/5789)
CA-125	2% (135/5789)
Other	21% (1177 63/5789)

Visualising data and recommendations



CPG + Real World Data

Endometrial cancer cpg + NKR-data

Endometriumcarcinoom

Endometriumcarcinoom - Complete stadiëring of debulking

Uitgangsvraag
 Bij welk histologisch type van het endometriumcarcinoom is een complete uitdijking of debulking geboden?
 Zijn deze pathologieën pre- of postoperatief te behandelen?
 Hoe uitgebreid moet de complete stadiëring of debulking zijn?
 Hoek het wel of niet verschillen van een complete uitdijking of debulking gevolgen voor het toezien en de keuze van adequate therapie?

Aanbeveling
 Bij elk histologisch type van het endometriumcarcinoom is een complete uitdijking of debulking geboden. De operatieve uitdijking moet pre- of postoperatief een totaal stagedebulking omvatten van het endometriumcarcinoom met gefagociterend, een complete uitdijking of debulking omvatten, met gebruikmaking van het lokaal vroege stadium endometriumcarcinoom (de volgende soorten endometriumcarcinoom of sarcoma: Chorioepithelioïde endometriumcarcinoom, endometrioïde endometriumcarcinoom, endometrioïde sarcoma, endometrioïde sarcoma met chorioepithelioïde componenten). Bij een sarcoma van minimaal 2% sarcoma component wordt behandeld als zijde van sarcoma endometriumcarcinoom.
 Bij een histologisch type van het endometriumcarcinoom dat niet aan de criteria van de operatieve uitdijking of debulking voldoet, kan worden overwogen om, gezien de aanpakke kans op recidiveren, patiënten aan te bevelen de een NCR (National Cancer Registry) te raadplegen voor de keuze van adequate therapie.
 Voor de definitie en het gebruik van de termen zie de NKR (National Cancer Registry) website.

+

meest aanbevolen kankersites 2018

Site	Value 1	Value 2
prostaat	18,1	18,5
borst	12,9	11,2
long	11,9	10,9
lymfeklier en leukemie	9,1	7,2
blaas en urinewegen	3,6	5,2
slokdarm en cardia	3,6	2,6
hoofd en hals	2,9	1,9
nier	1,9	1,7
alvleesklier	1,9	1,7

CRGO

NCR

What happened to my patients?



Visualising data and recommendations

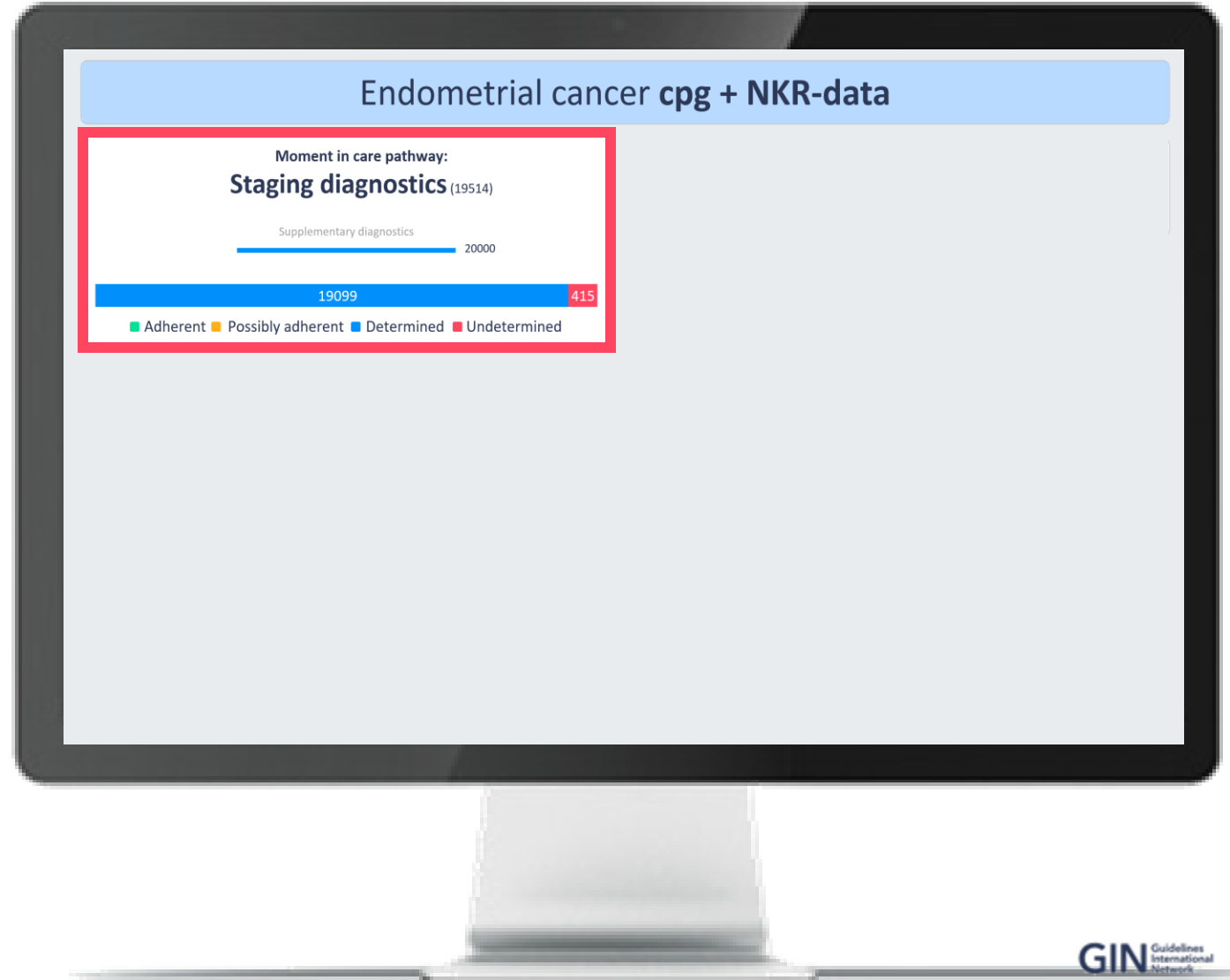
CPG + Real World Data

Select a decision tree of interest

See precursor trees

Visualize number of determined patients

What happened to my patients?

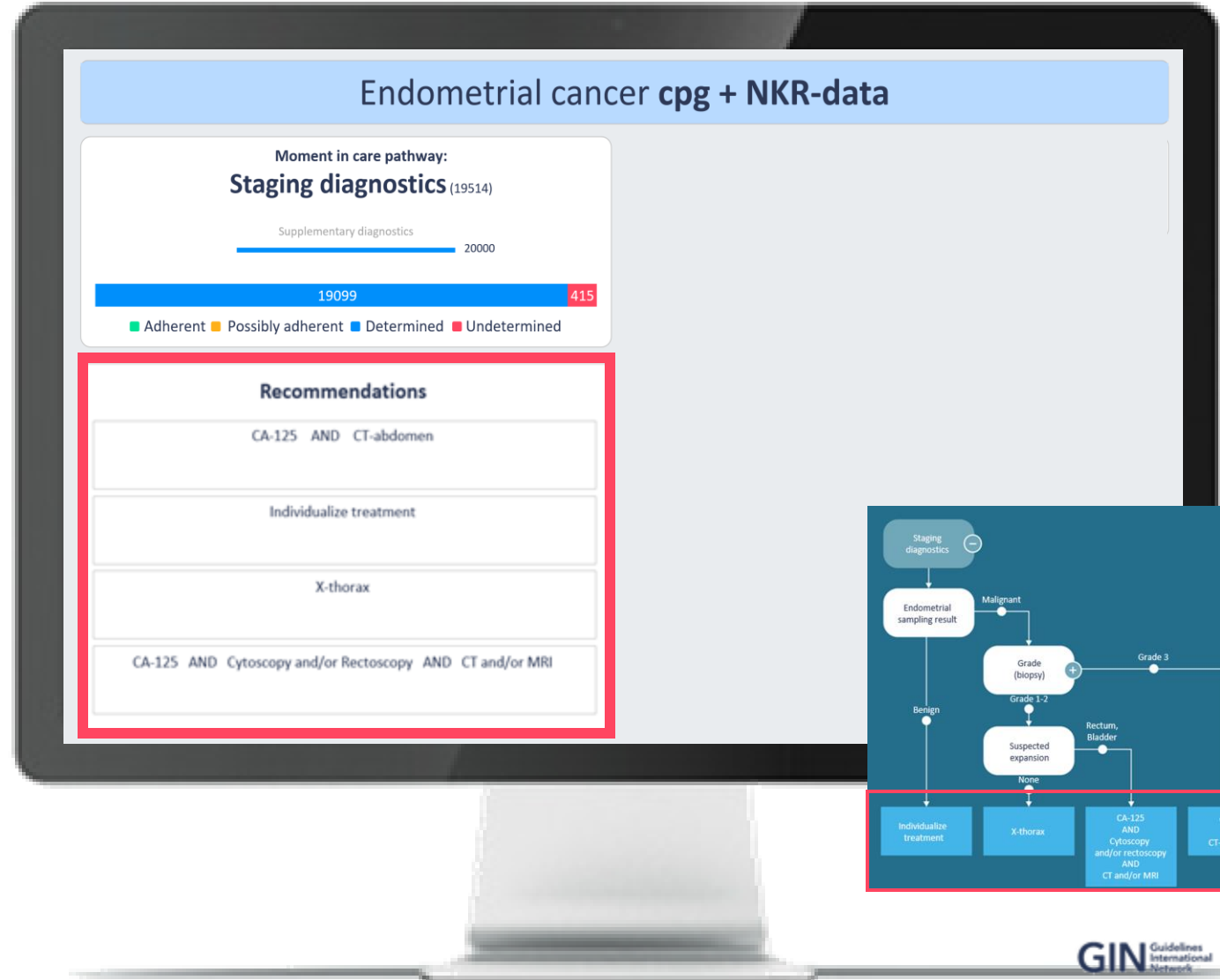


Visualising data and recommendations

CPG + Real World Data

Guideline recommendations for a specific moment in the carepathway

What happened to my patients?

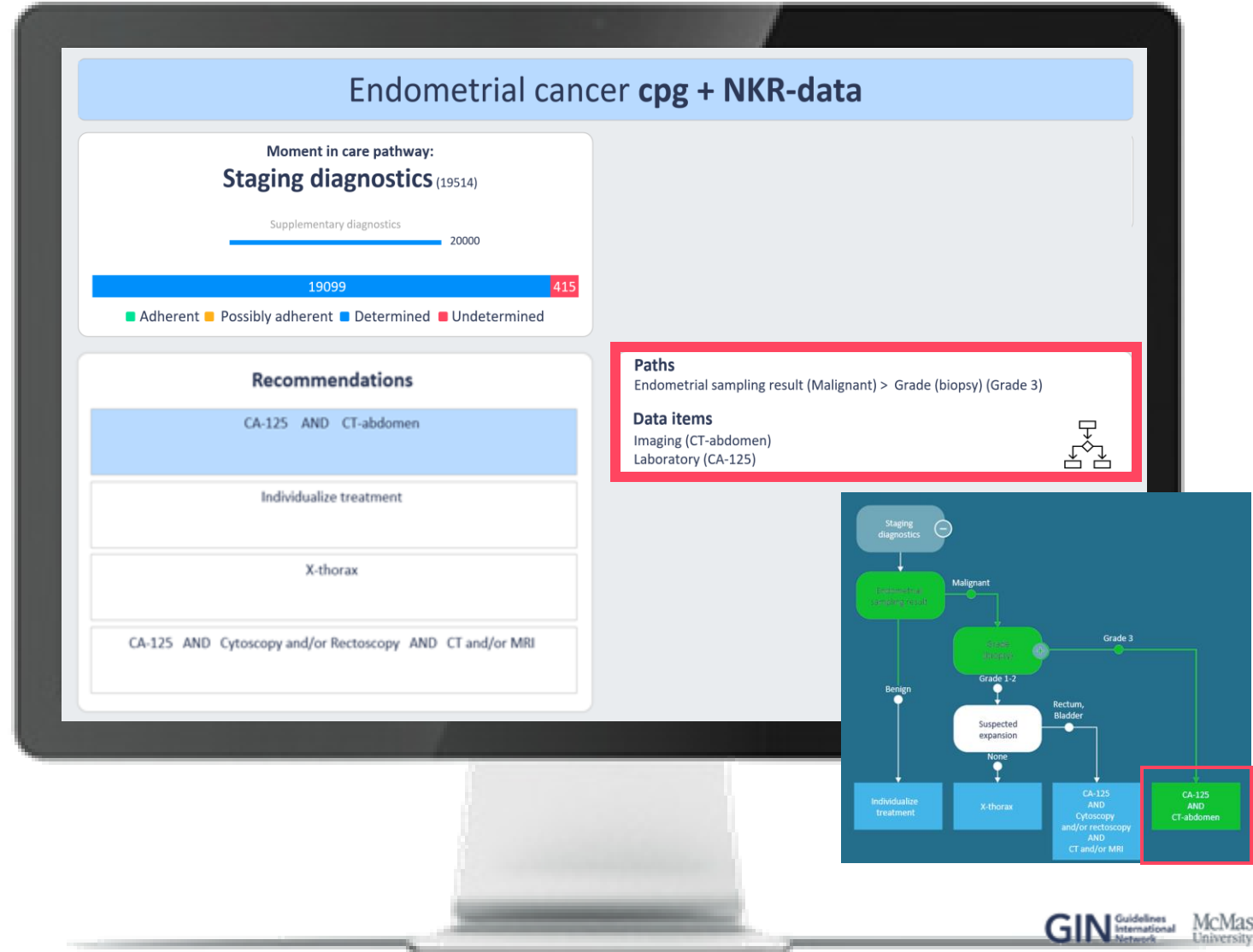


Visualising data and recommendations

CPG + Real World Data

Paths leading to an individual recommendation show subpopulations

What happened to my patients?

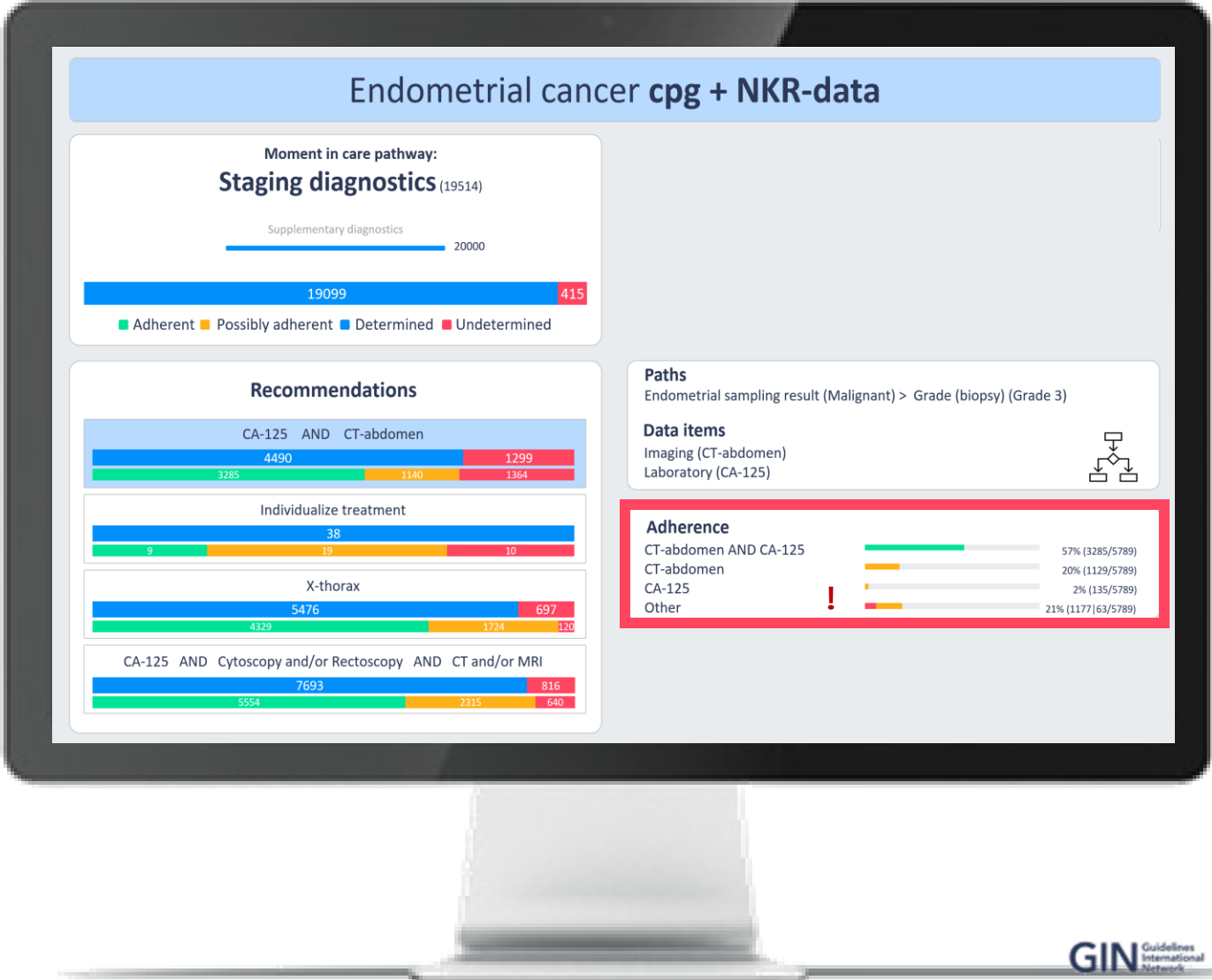


Visualising data and recommendations

CPG + Real World Data

Insights in which interventions actually happened in those populations

When do we diverge from the guideline?
 What happened to my patients?

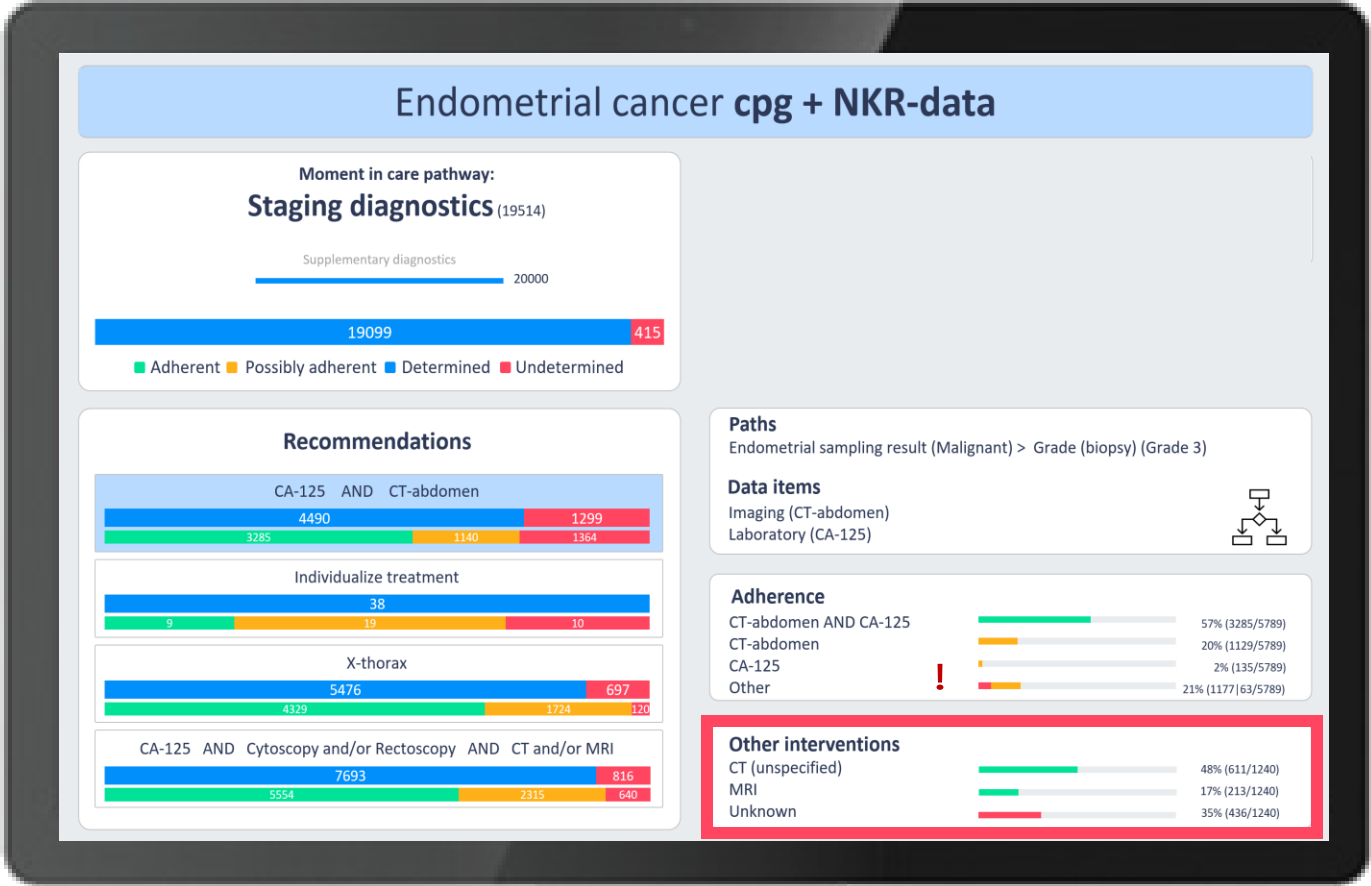


Visualising data and recommendations

CPG + Real World Data

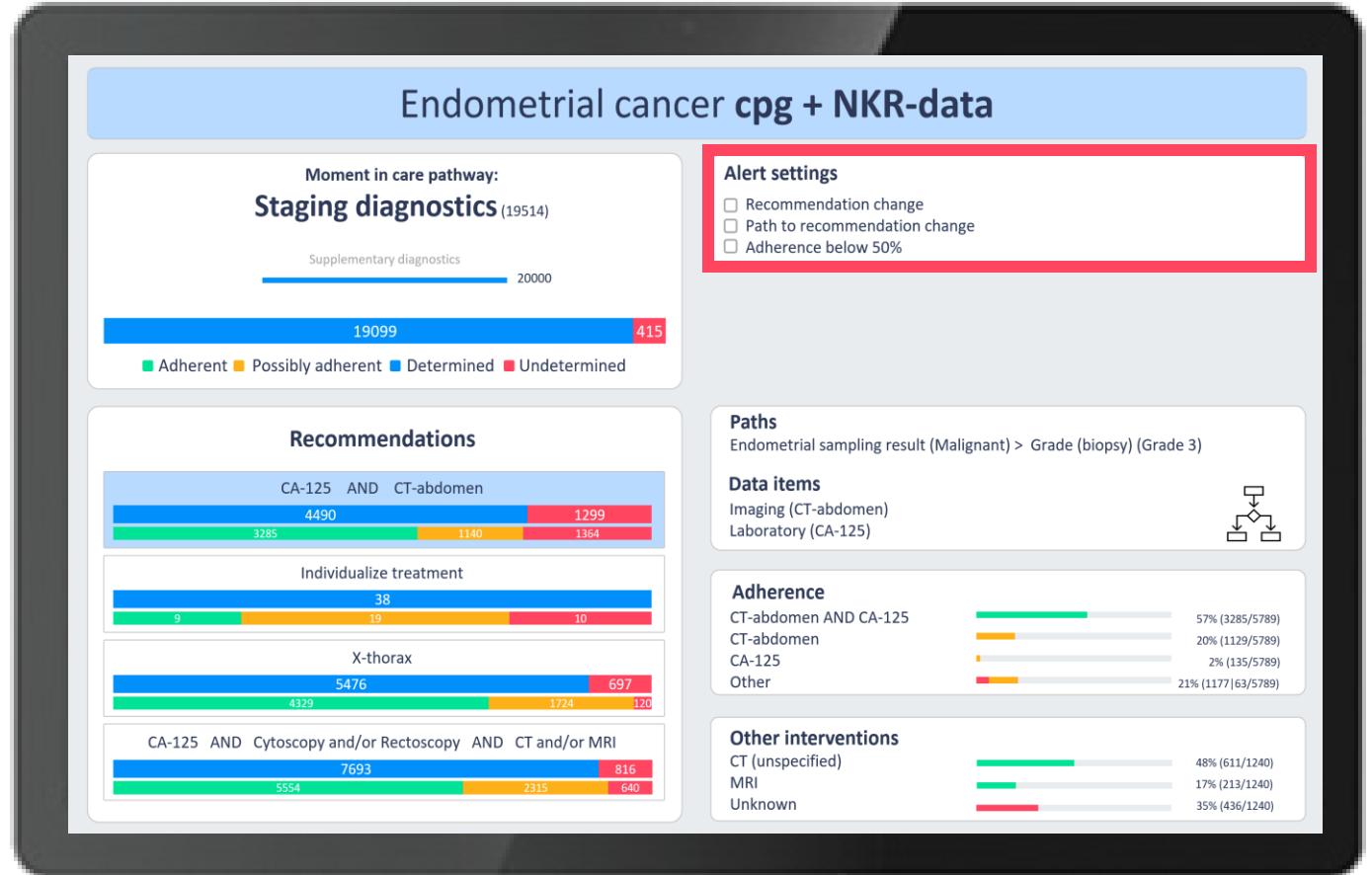
When not adherent to the guideline:
which intervention was given instead?

When do we diverge from the guideline?
Why is adherence this low?
Is that bad?
What happened to my patients?



Visualising data and recommendations

Alert settings



When do we need to revise a module?



Visualising data and recommendations

CPG versus CPG



When do we need to revise a module?

Why does their recommendation differ from ours?

Is that bad?



Visualising data and recommendations

CPG versus CPG

Recommendations in this decision tree

- Corresponding recommendations
- Dutch-guideline only
- NCCN®-guideline only

When do we need to revise a module?

Why does their recommendation differ from ours?

Is that bad?



Endometrial cancer cpgs: CRGO vs NCCN			
Moment in care pathway			
Staging diagnostics			
Recommendations			
	Both guidelines	CRGO	NCCN
CA-125 AND CT-abdomen	✓ x	✓	x
Individualize treatment	x	✓	x
X-thorax	x	✓	x
CA-125 AND Cytoscopy and/or Rectoscopy AND CT and/or MRI	x	✓	x
Chest CT (without contrast)	x	x	✓
Consider PET/CT	x	x	✓

Visualising data and recommendations

CPG versus CPG

Extra information for the highlighted recommendation

- Specific recommendations
- Detailed eligible populations

When do we need to revise a module?

Why does their recommendation differ from ours?

Is that bad?

Endometrial cancer cpgs: CRGO vs NCCN

Moment in care pathway			
Staging diagnostics			
Recommendations			
	Both guidelines	CRGO	NCCN
CA-125 AND CT-abdomen	✓ x	✓	x
Individualize treatment	x	✓	x
X-thorax	x	✓	x
CA-125 AND Cytoscopy and/or Rectoscopy AND CT and/or MRI	x	✓	x
Chest CT (without contrast)	x	x	✓
Consider PET/CT	x	x	✓

CRGO CPG decision tree(s)	NCCN CPG decision tree(s)
Supplementary diagnostics	PD-1: initial evaluation PD-2: initial workup imaging PD-3: additional chest imaging
Recommendations	
Imaging CT-abdomen Laboratory CA-125	Imaging Chest CT without contrast
Paths	
Result sonography Divergent Endometrial sampling result Malignant Grade (biopsy) Grade 3	Fertility preservation Yes, No Type of diagnosis Symptomatic, Incidental finding MRI contraindication Yes, No Grade 1, 2, 3 Chest imaging CT, X-ray Suspected metastases Yes



Visualising data and recommendations


CPG versus CPG


Endometrial cancer cpgs: CRGO vs NCCN

Moment in care pathway
Staging diagnostics

Recommendations

	Both guidelines	CRGO	NCCN
CA-125 AND CT-abdomen	✓ x	✓	x
Individualize treatment	x	✓	x
X-thorax	x	✓	x
CA-125 AND Cytoscopy and/or Rectoscopy AND CT and/or MRI	x	✓	x
Chest CT (without contrast)	x	x	✓
Consider PET/CT	x	x	✓


CRGO CPG decision tree(s)
Supplementary diagnostics


NCCN CPG decision tree(s)
PD-1: initial evaluation
PD-2: initial workup imaging
PD-3: additional chest imaging

Recommendations

CRGO	NCCN
Imaging CT-abdomen Laboratory CA-125	Imaging Chest CT without contrast

Paths

CRGO	NCCN
Result sonography Divergent Endometrial sampling result Malignant Grade (biopsy) Grade 3	Fertility preservation Yes, No Type of diagnosis Symptomatic, Incidental finding MRI contraindication Yes, No Grade 1, 2, 3 Chest imaging CT, X-ray Suspected metastases Yes

Alert settings

Recommendation change

Path to recommendation change

When do we need to revise a module?

Why does their recommendation differ from ours?

Is that bad?



Advantages



Demonstrated advantages

More compact modules and better overview

Less inconsistency and ambiguous recommendations

Insights from combined different data sources

Proof of concept advantages

Manageable maintenance of guideline modules

Faster and cheaper revisions

Take home messages



Visualising data and recommendations

Too much knowledge to process by any individual is trapped in free text

Translation of text to CDTs using information standards improves reusing data

CDTs and Real World Data are building blocks for guideline development

Decision support systems enable implementation of Real Word Data Insights

Visualizing (combined) data sources supports doctors, guideline developers and patients

- All needed data available at the point of care
- Insights in patients options and their preferences (SDM)
- Insights in adherence and other guideline suggestions may speed up revision processes

Want to talk further?

Let's meet @ the Gala Dinner tonight



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More information in the G-I-N Learning Toolbox App