

*Center for Translational and Policy Research
on Personalized Medicine*

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Adoption of Genomics in Oncology Care

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Questions

- 1) What are necessary components for appropriate adoption?
 - 2) What is status of adoption?
 - 3) What are opportunities & challenges?
- Particular focus on new technologies: multiplex/panel testing & tumor sequencing

Appropriate Adoption is Determined By Continuum of Factors

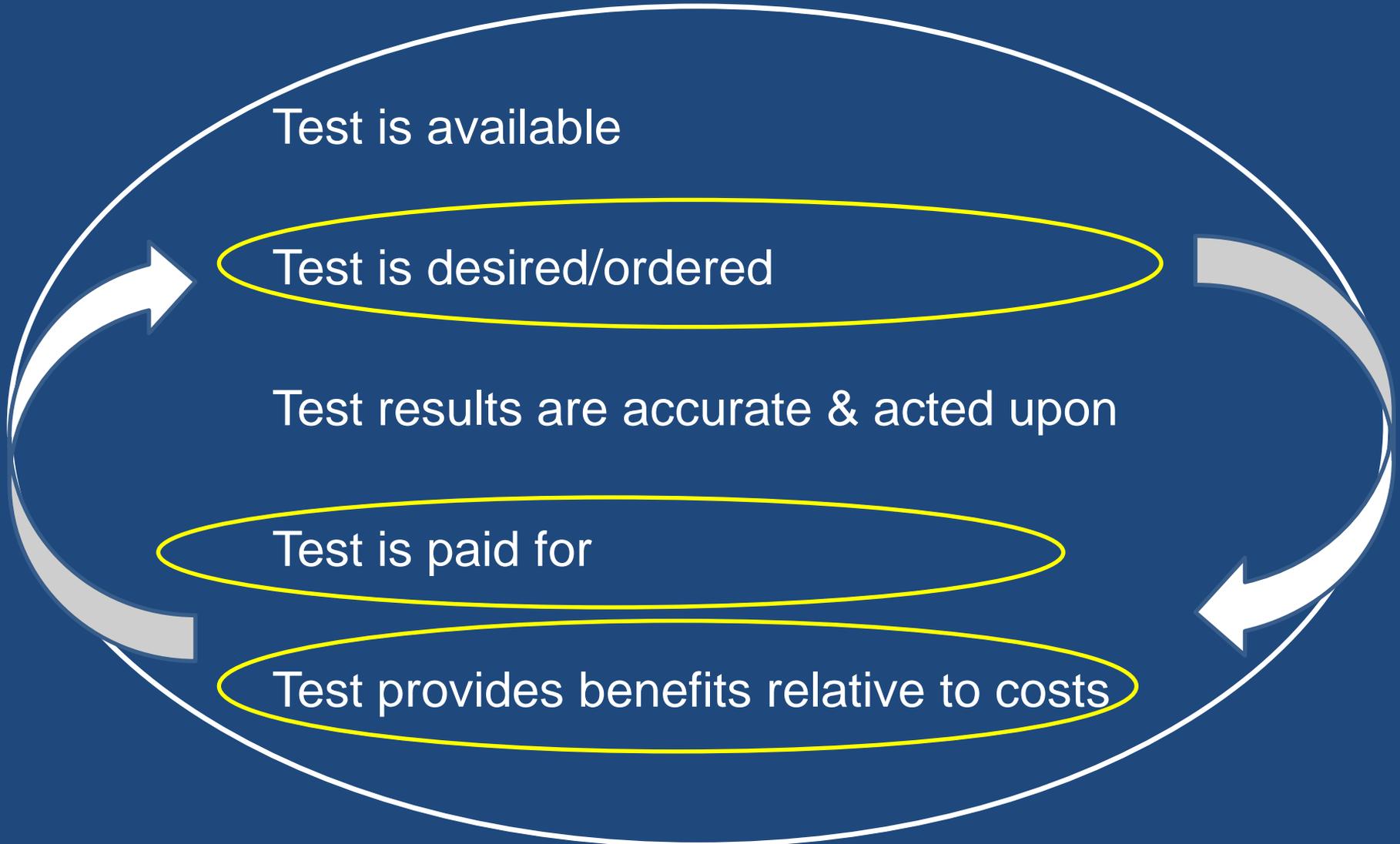
Test is available

Test is desired/ordered

Test results are accurate & acted upon

Test is paid for

Test provides benefits relative to costs



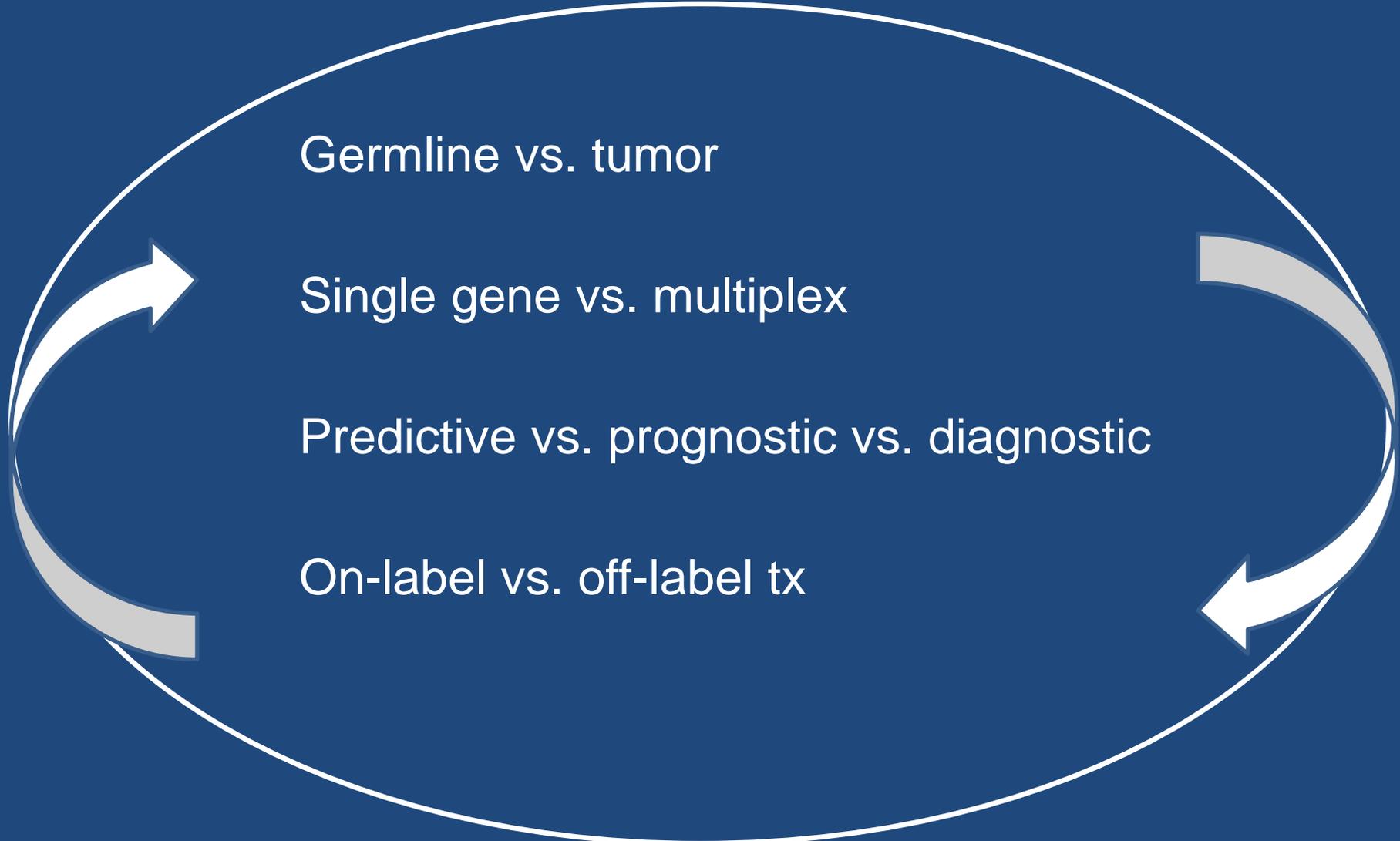
Appropriate Adoption is Defined by Range of Characteristics

Germline vs. tumor

Single gene vs. multiplex

Predictive vs. prognostic vs. diagnostic

On-label vs. off-label tx



Needed for Adoption:
Test is Desired/Ordered by
Patients & Providers

Patients: Want It (sort of) When They Understand It

- Our recent national survey analyses:
 - 75% not familiar with “personalized medicine”
 - After definition, 95% expected benefits
 - If testing indicates NO benefit from cancer tx, 84% would want tx anyway or 2nd opinion
- *Garfield et al, Consumer familiarity, perspectives, & expected value of PM with focus on applications in oncology, Personalized Medicine (in press)*

Patients: Want It “All” Especially If Don’t Have to Pay for It

- Our analyses of willingness-to-pay for gene panels & whole genome sequencing
 - High interest but WTP varies based on price & income
 - Desire for all results even if no clinical use – although sensitive to price

(not oncology patients)

Providers:

Some Want It When They Understand It

- Enthusiasm of oncologists for germline & tumor testing but lack of knowledge & comfort
- Community oncologists were more likely to use tests than academics (NC)

– *Dressler et al. Cancer PGx, Adoption by Oncologists and Patient Benefit. Personalized Medicine. 2014*

- Wide variation in multiplex tumor testing use, genomic confidence, & disclosure of results among oncologists at DFCC

– *Gray et al. Physicians' Attitudes About Multiplex Tumor Genomic Testing, JCO 2014.*

Providers: Everyone Sees Changes Coming (And Here!)

- Genetic counselors see huge changes in practices & test options
 - *Hooker et al, ACMG conference poster, 2014*

The New York Times

Cancer Centers Racing to Map Patients'
Genes (4/21/13)

Needed for Adoption:
Test is Paid For

Germline Panels are Challenging for Coverage Policies

- Our work shows BRCA 1/2 tests & panels have proliferated & prices have dropped
- But panels not covered

Payers without ANY Coverage Policies	35%
Of payers with policies, panels covered	0%
Of payers with policies, all panels Investigational	64%

» *Clain et al. Emergence of New BRCA1/2 Tests and Gene Panels: Availability & Payer Coverage Policies (under review)*

Tumor Sequencing is Challenging for Coverage Policies

- Our work shows payers see benefits of NGTS but concerns

Does not fit medical necessity definition	80%
“Bundle” of targets vs. tumor characterization	70%
Skepticism re new evidentiary methods	70%

Trosman et al, Challenges of coverage policy development for NGTS panels: experts and payers weigh in. JNCCN (in press)

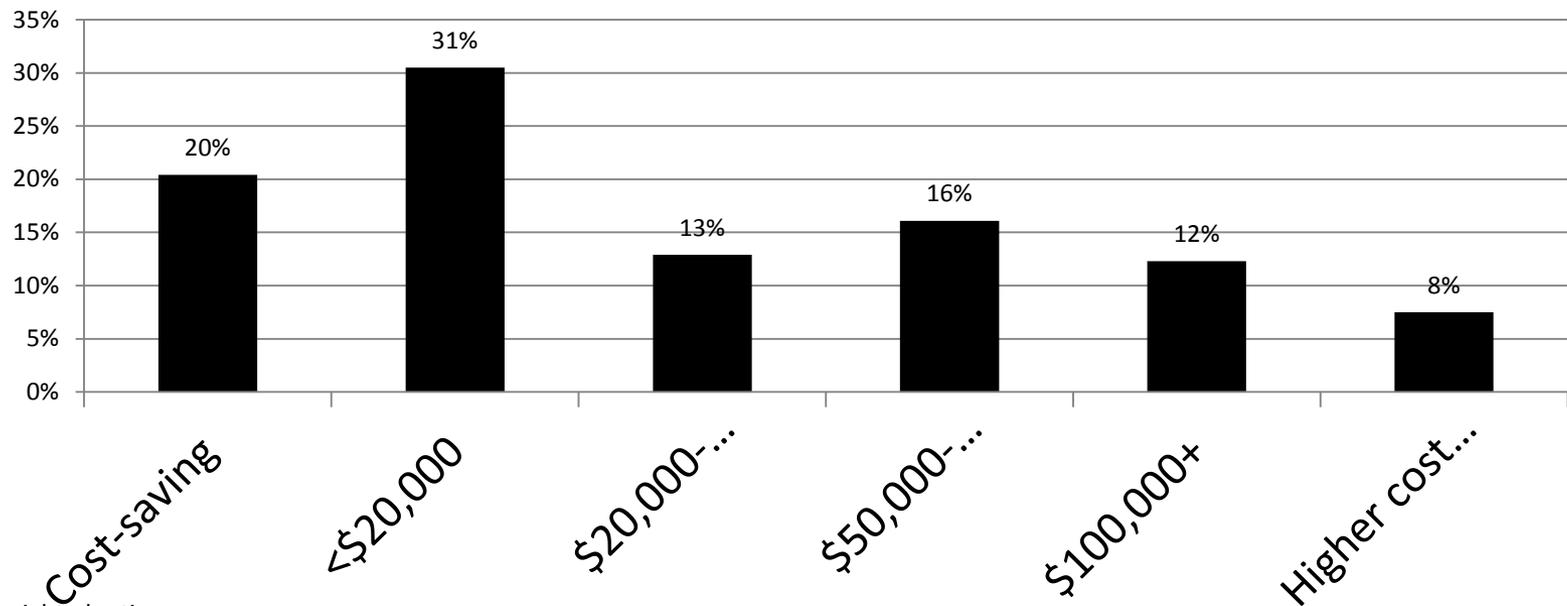
Personalized medicine has a lot of promise.... but nothing frightens managed care folks more than hearing the word “promising” from an oncologist. That means that they want us to pay for something expensive that they don't have any supporting data for yet.

Anonymous payer

Needed for Adoption:
Test Provides Benefits Relative to Costs

Genetic Testing Generally Provides More Benefits at Higher Cost

Distribution of Cost per QALY Gained



N=136 weighted ratios

- *Phillips et al. Economic value of PM tests: what we know and what we need to know. GIM, 2013*

Value of Multiplex/Panel Testing Difficult to Determine

- Multiple findings, each with own benefits/costs
- Costs include not only testing assay but also infrastructure, interpretation, counseling
- Benefits/costs:
 - Vary by clinical scenario
 - May occur downstream
 - May include personal utility/disutility
 - May accrue to family members

Clinical Utility & Economic Value will Vary Depending on How Sequencing Used

Sequencing Input

- Which patients are sequenced
- Why patients are sequenced
- What is sequenced



Sequencing Methods

- Technology used
- Extent of sequencing



Sequencing Output

- How findings are examined and reported
- Clinical relevance of findings

Conclusions & Future Agenda

- Need more evidence
 - Operational utility & clinical utility
 - How testing actually used
 - Value broadly defined
 - Integrated
- Improved evidence, careful framing of information, and standardization - vs. education alone - will best facilitate appropriate adoption
 - Behavioral economics can inform provision of information
 - Guidelines can be used to structure decisionmaking
 - Create publicly available databases of test availability, test price, insurer policies, and economic evidence

Conclusions & Future Agenda

- Need methods for evaluating multiplex/panel testing
 - How to prorate/aggregate value of multiple markers
 - How coverage policies can be developed\
 - How to examine downstream benefits/costs/risks
- Need prospective studies that include *full range* of factors related to adoption: what testing done, results, treatment, outcomes, costs/benefits, quality-of-life/preferences
- Need studies of changing policy environment, e.g., CPT codes, ACOs