

Biomarker Testing Overview

Jill Kolesar, PharmD, MS

University Research Professor

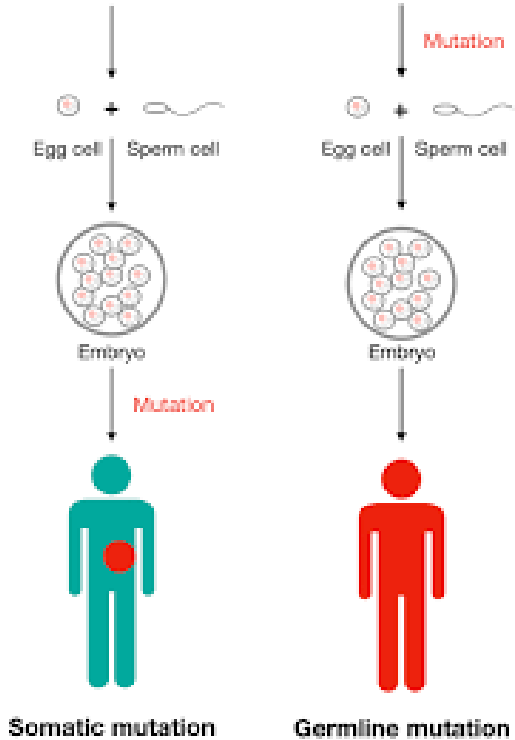
College of Pharmacy

University of Kentucky

Jill.kolesar@uky.edu



Somatic versus Inherited Genetic Variability (Mutation)



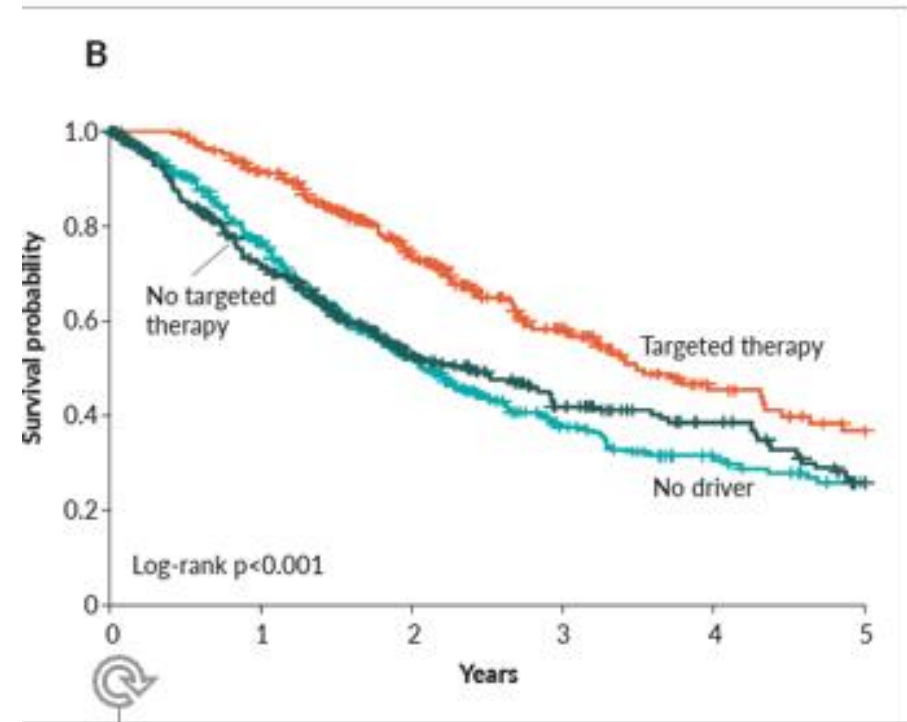
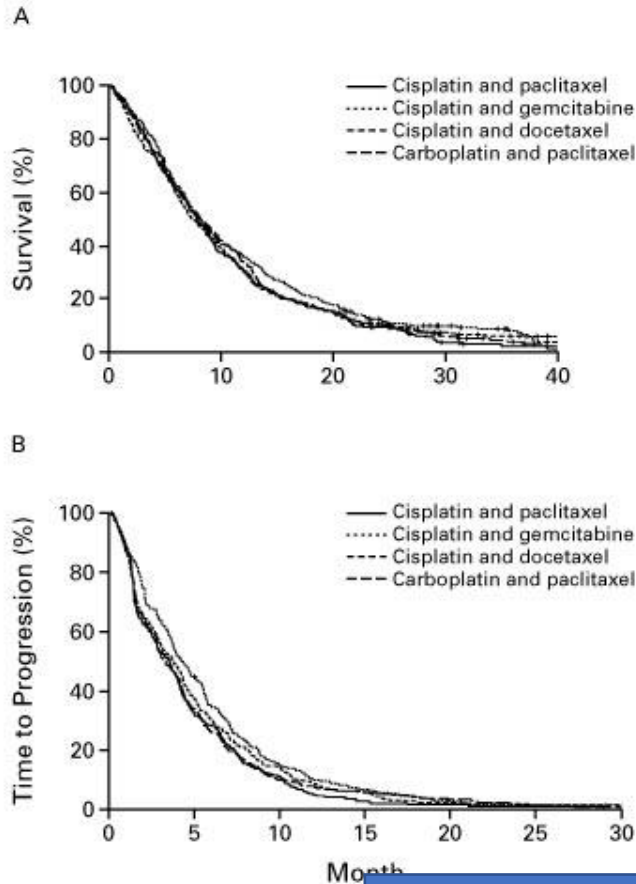
	Somatic	Germline
Location	Only some cells	All cells
Heritability	Not passed to children	Passed to children
Diseases	Cancer (90%)	Cancer (10%) Inborn errors of metabolism Cardiac defects Malignant hyperthermia Drug metabolism
Use	Diagnosis of cancer Selection of treatment	Selection of treatment Prevention of disease Prevention of adverse effects
Cost (KY Medicare/Medicaid)	Panel 5-50 genes: \$597.91 Panel > 50 genes: \$2919	Varies



NSCLC Treatment After Genomics

2002: Survival 8 months

2022: Survival 4 YEARS



- 12 different gene targets (biomarkers), with > 25 possible drugs
- More than 75% of patients with NSCLC are candidates for

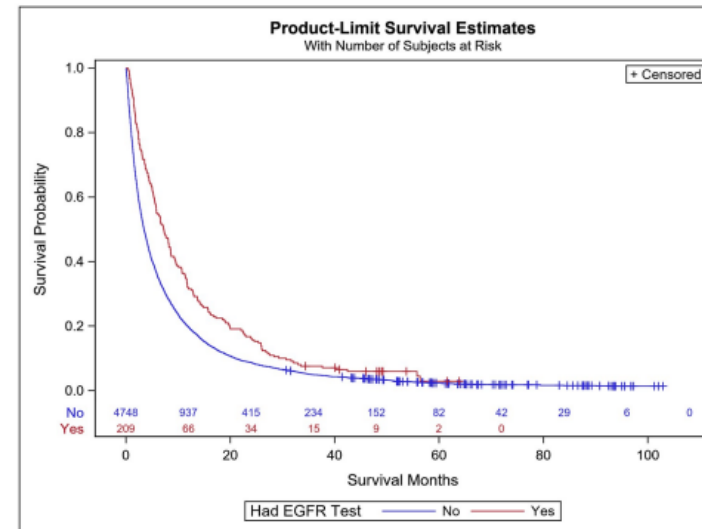
Cancer Mutation Testing in Kentucky

- Population: Stage IIIb-IV NSCLC in SEER with associated claims data (Medicare or private)
- EGFR Testing Rate 2010: 5.9%
- EGFR Testing Rate 2011: 10.6%

HR:0.77; 95% CI 0.67-0.79 p=0.0003

Table 3. Factors associated with having EGFR somatic mutation testing in Stage IIIb–Stage IV NSCLC patients.

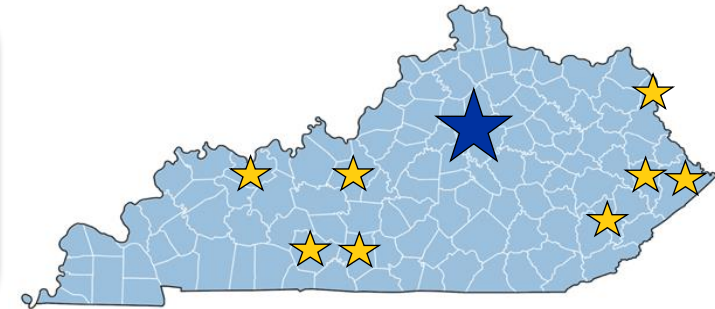
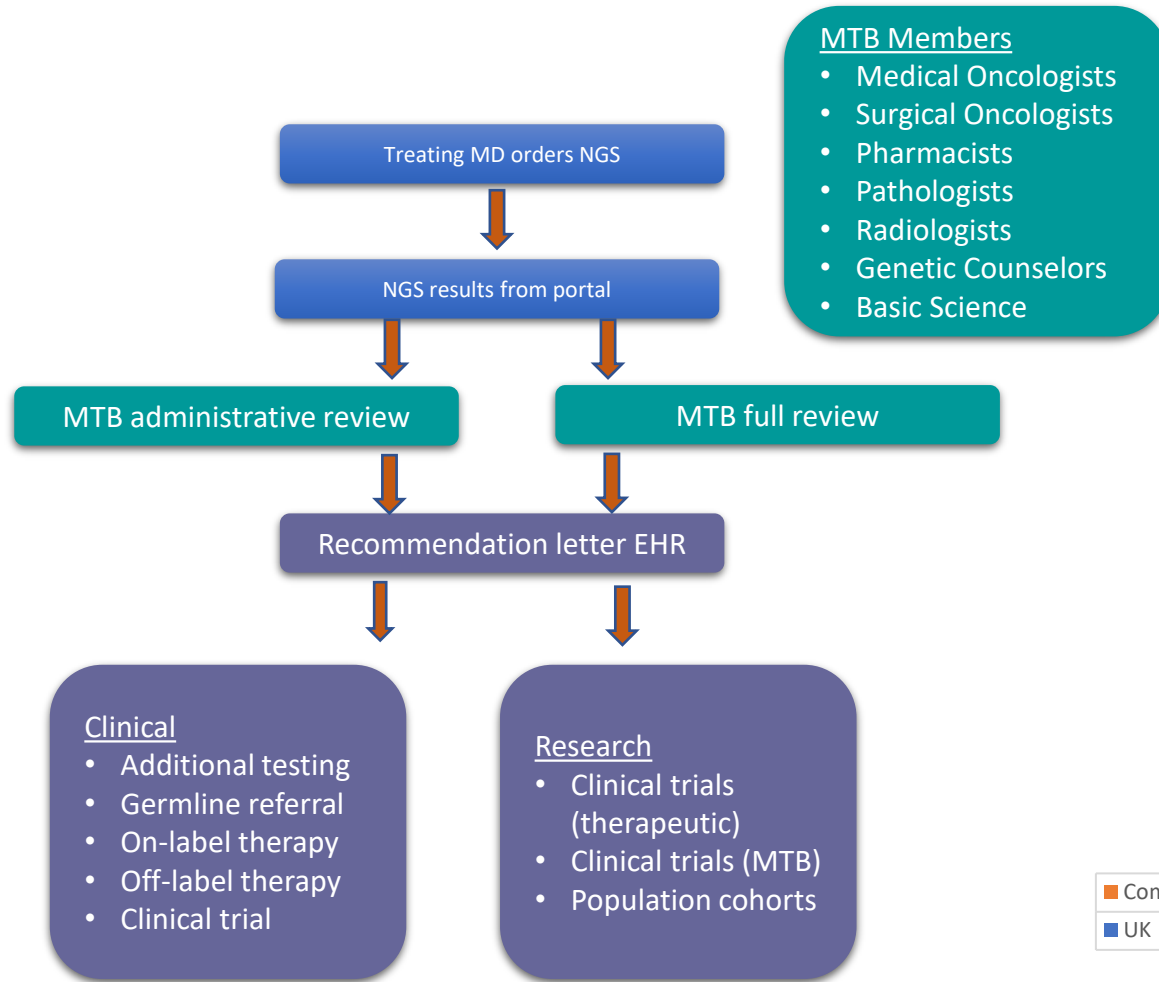
Modeling Had EGFR Testing		
Variable	OR (95% CI)	P-Value
Age (ref = 75+)		0.0001
20–49	4.15 (2.17–7.91)	
50–64	1.76 (1.16–2.67)	
65–74	1.39 (0.98–1.98)	
Sex (ref = Male)		0.0142
Female	1.44 (1.08–1.93)	
Appalachian Status (ref = Non-Appalachia/Metro)		0.0011
Appalachian/Metro	0.67 (0.28–1.59)	
Appalachian/Non-Metro	0.51 (0.36–0.73)	
Non-Appalachian/Non-Metro	0.60 (0.40–0.89)	
Year of Diagnosis (ref = 2007)		<0.0001
2008	3.81 (0.43–34.68)	
2009	22.30 (3.00–165.41)	
2010	58.56 (8.12–422.26)	
2011	113.47 (15.81–814.21)	
Insurance (ref = Private)		<0.0001
Medicaid	0.19 (0.09–0.40)	
Medicare	0.61 (0.44–0.84)	



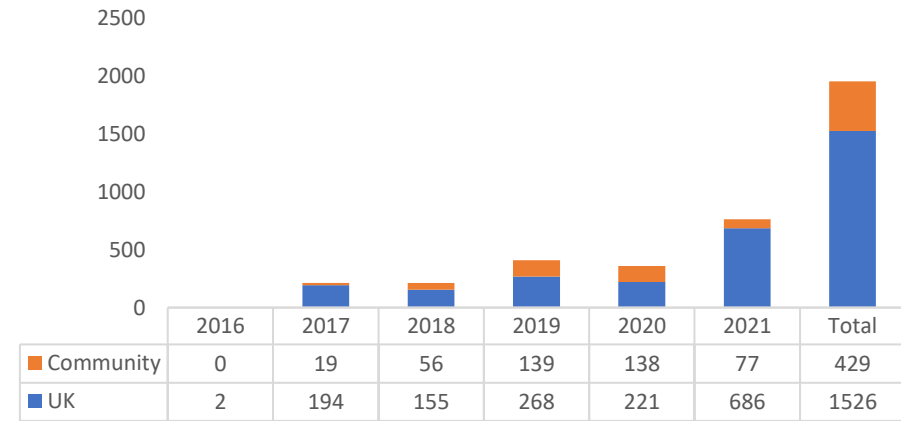
Kolesar, etal 2020, PLOS One



Molecular Tumor Boards: An Implementation Strategy for Precision Oncology



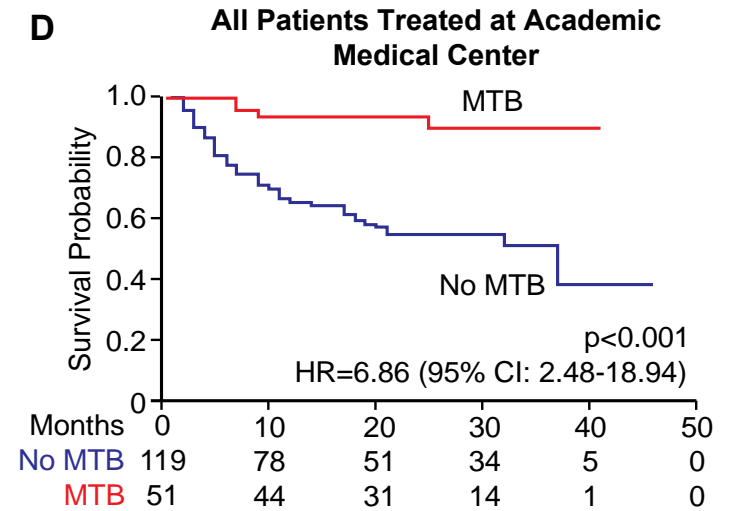
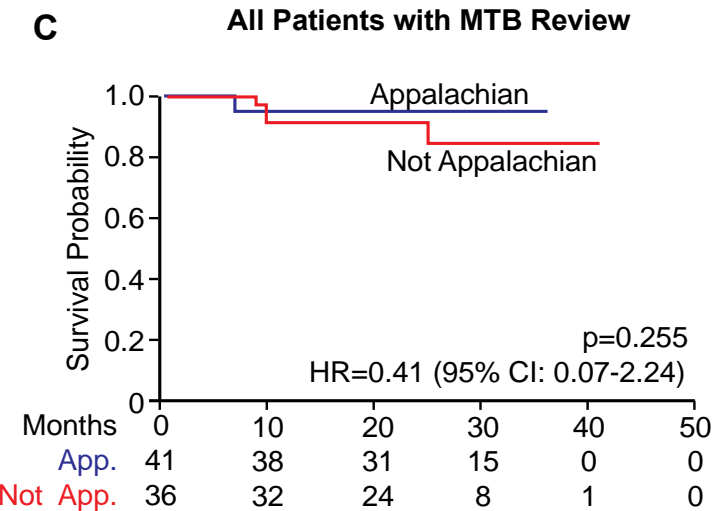
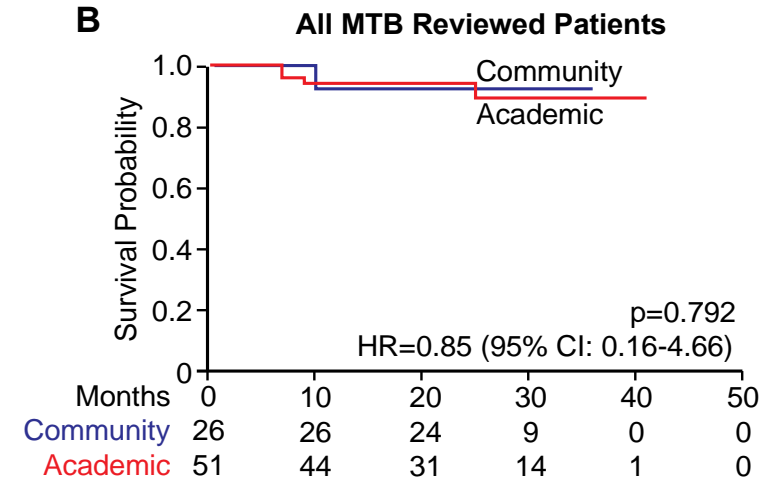
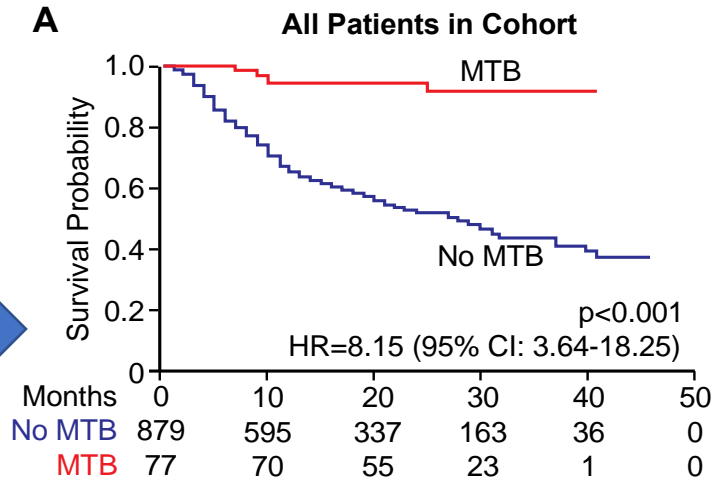
MTB Cases



■ UK ■ Community

Background – Outcomes of Case Control Study

MTB Review = 8X Longer Survival



Thank you!

Questions?

Jill Kolesar

Jill.kolesar@uky.edu

