

# Prospective Evaluation of HCC Surveillance Benefits and Harms in a Cirrhosis Patient Population

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## BACKGROUND

- The value of cancer screening programs must account for both benefits (e.g. early tumor detection) and potential harms (physical, financial, and psychological)
- Hepatocellular carcinoma (HCC) surveillance is recommended in patients with cirrhosis,
  - Supported by level II data suggesting an association with improved early detection and improved survival
- However, HCC surveillance may be associated with potential harms, e.g. diagnostic testing for false positive or indeterminate screening results, in 15-20% of patients

## AIMS

- Prospectively characterize potential benefits and harms of HCC surveillance in a large, racially and socioeconomically diverse cohort of patients with cirrhosis

## METHODS

- Prospective cohort study among 803 patients with cirrhosis, of any etiology, followed at Parkland Health and Hospital System, the safety-net health system for Dallas County, between December 2014 and March 2017.
- We identified patients with documented cirrhosis (using ICD-9/ICD-10 code) or suspected cirrhosis (elevated APRI with chronic liver disease).
  - Cirrhosis diagnosis was confirmed by chart review, i.e. characteristic imaging (nodular appearing liver with portal hypertension), histology, or a non-invasive marker of fibrosis (e.g. Fibroscan or Fibrotest)
  - Excluded patients with Child C cirrhosis, history of HCC, history of liver transplantation, language other than English or Spanish
- We obtained waiver of consent to minimize bias by Hawthorne effect
- Patients followed until death, incident HCC, lost to follow-up, or end of the 18-month study period
- Surveillance benefits were defined as early tumor detection, i.e. BCLC stage 0/A
- Surveillance-related physical harms were defined as CT or MRI scans, biopsies, or other procedures that were performed for evaluation of false positive or indeterminate surveillance results
  - Definition based on nomenclature developed to evaluate screening harms in other cancers, e.g. lung and colon cancer

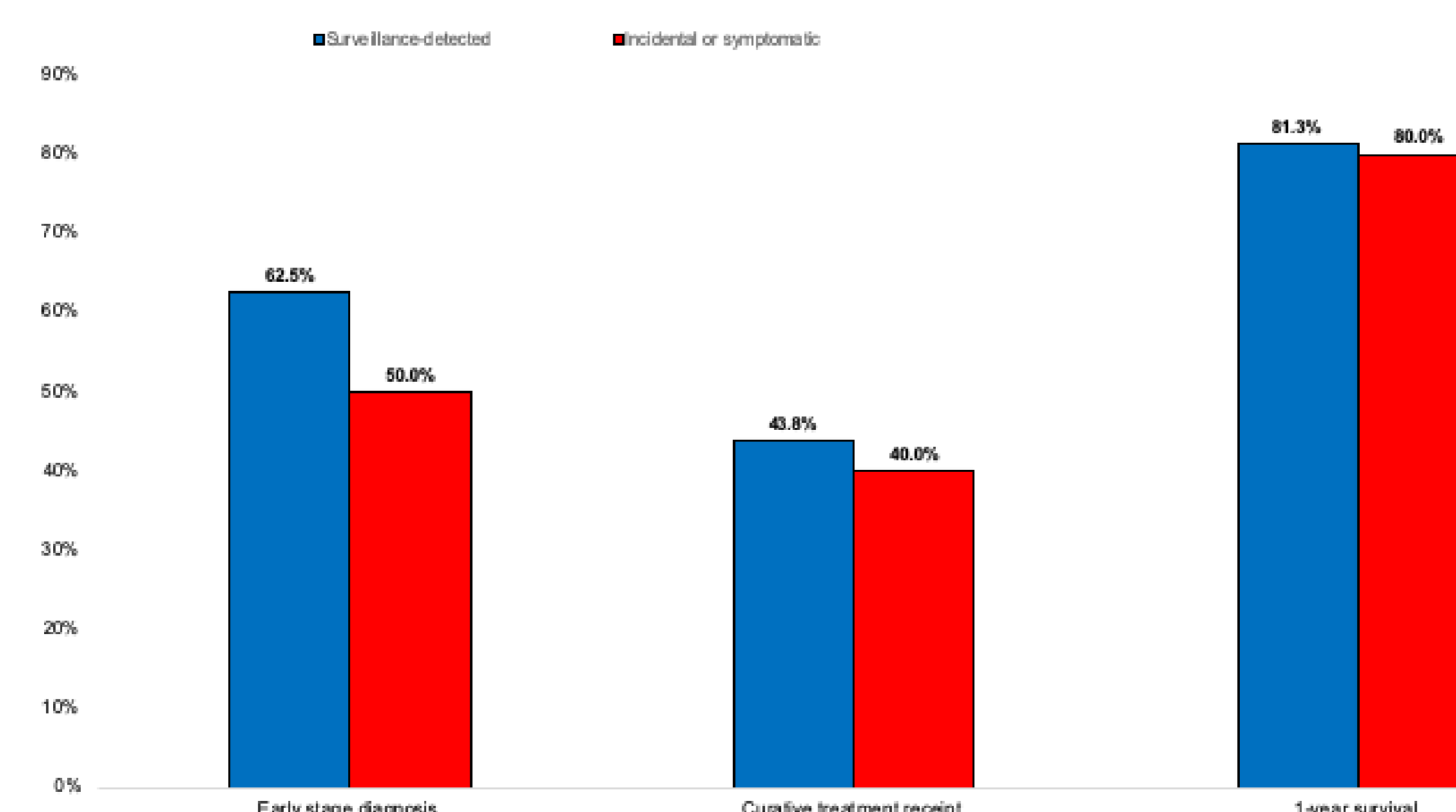
## RESULTS

Table 1: Patient Characteristics

Variable	Number
Age (mean, SD)	56.8 ± 9.4
Gender (% male)	493 (61.4)
<b>Race/ethnicity</b>	
Non-Hispanic White	240 (29.9)
Hispanic White	203 (25.3)
Black	350 (43.6)
<b>Liver Disease Etiology</b>	
Hepatitis C	423 (52.7)
Hepatitis B	21 (2.6)
Alcohol-related	203 (25.3)
Non-alcoholic steatohepatitis	105 (13.1)
Other/ Unknown	51 (6.3)
Child Pugh (% Child A)	459 (57.2)
Hepatology Care year prior	299 (37.2)
<b>Charlson Comorbidity</b>	
0 – 1	226 (32.2)
2	135 (16.8)
≥3	442 (55.0)

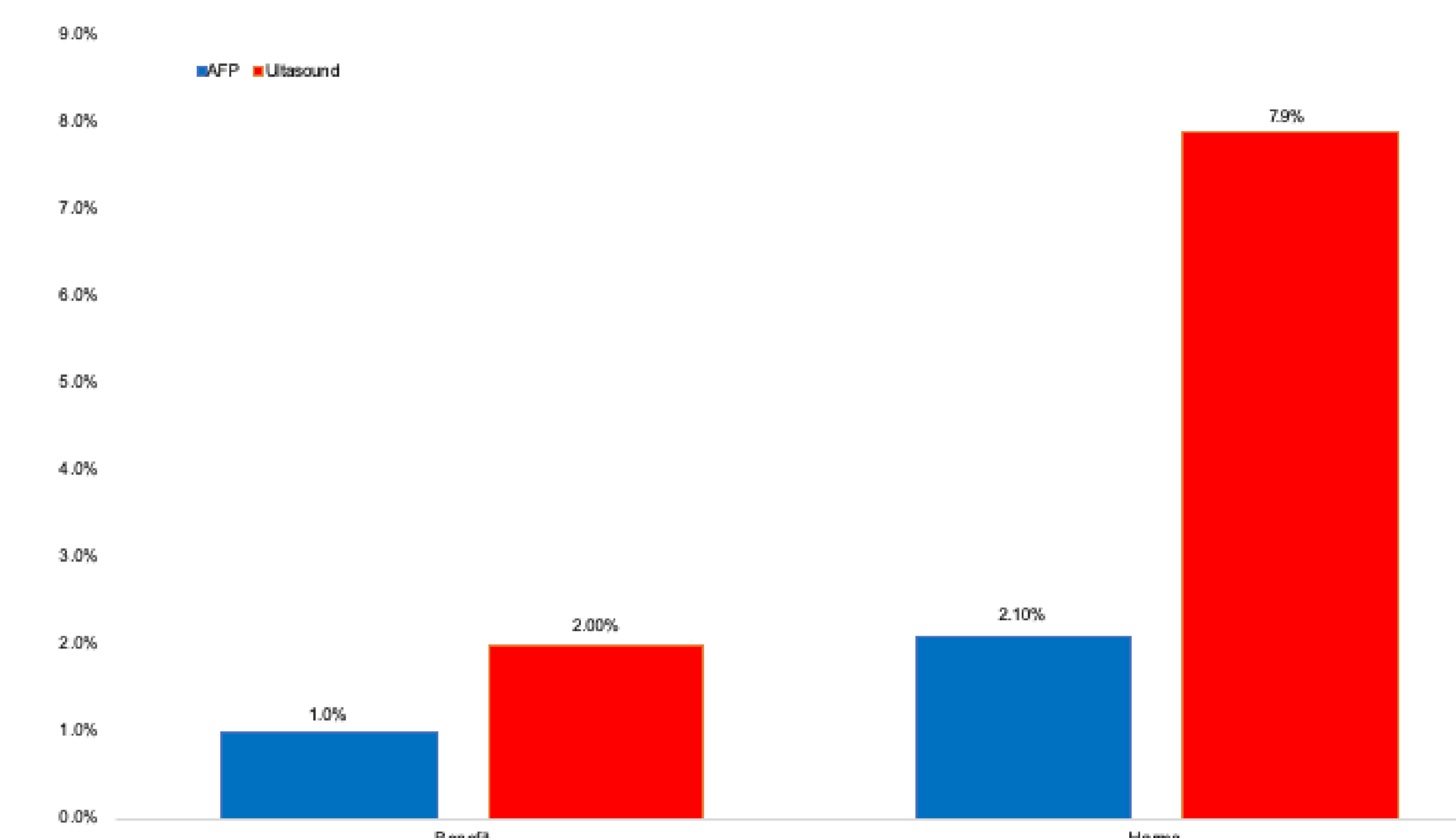
- During study period, 129 (16.1%) had semi-annual surveillance with ultrasound +/- AFP, 415 (51.7%) some surveillance, and 259 (32.2%) no surveillance or AFP alone

Figure 1: Surveillance Benefits



- HCC diagnosed in 26 patients – 16 via surveillance and 10 incidentally or symptomatically
- Early stage detection, (p=0.69), curative treatment receipt (p=1.0), and 2-year survival (p=0.83) did not differ between surveillance and incidental/symptomatic presentation

Figure 2: Surveillance Harms



- Physical harms observed in 54 (8.8%) of patients
- Ultrasound had fewer false positive results than AFP but higher odds of physical harms (OR 3.7, 95% CI 1.9 – 7.2).
  - Harm observed in 43 (7.9%) of 544 patients with ≥ 1 US - 34 mild and 9 moderate – compared to 11 (2.1%) of 518 patients with ≥ 1 AFP – all mild in nature

## Incidental Findings

- Of those with ≥ surveillance test, 40 (6.5%) found to have total of 53 incidental findings – 23 (57.5%) of low clinical importance and 17 (42.5%) of medium importance
- Incidental findings prompted repeat imaging for 25 patients but none required invasive work-up (endoscopy, biopsy, surgery)

## CONCLUSION

- Surveillance associated with high proportion of early HCC detection, with two-thirds of screen-detected patients found at an early stage (BCLC stage 0/A)
- Although 20% of patients had a false positive surveillance result, less than 10% of patients experienced surveillance-related physical harms
- Surveillance imaging can lead to incidental findings, although most appear to be of low clinical significance
- Multi-center studies over longer periods of time are needed to characterize surveillance value in patients with cirrhosis.

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