

The background features a complex network of orange and red nodes connected by thin lines, resembling a molecular or biological structure. A large, dark blue circle is centered on the page, containing the main text.

**CLDF**

*Chronic Liver Disease Foundation*

3<sup>RD</sup> ANNUAL  
**LIVER C<sup>ON</sup>NNECT**  
CONFERENCE

Accredited by:



Presented by:





**CLDF**

*Chronic Liver Disease Foundation*

3<sup>RD</sup> ANNUAL

**LIVER C**  **NNECT**

**CONFERENCE**

**WHISE**

# NAFLD/NASH: Lessons Learned From the Ladies' Liver

**Nadege T. Gunn, MD**  
MEDICAL DIRECTOR CLINICAL HEPATOLOGY  
IMPACT RESEARCH INSTITUTE  
Adjunct Assistant Professor Texas A&M School of Medicine  
Waco, TX

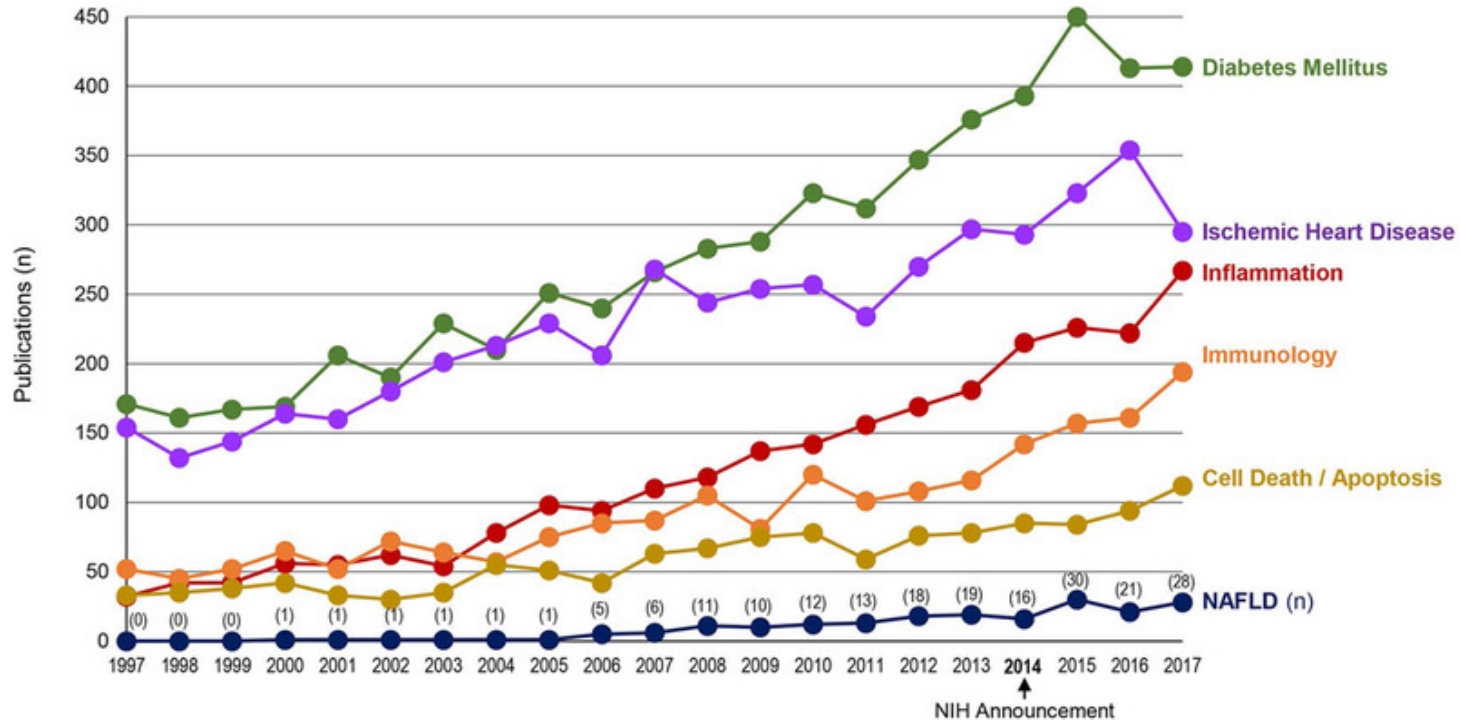


# Why Female Sex & Gender Matter in the Context of NAFLD/NASH

- Why do we care?



# Publications on Sex Differences in NAFLD



# How Does a Woman With NAFLD/NASH.....?



**FEEL**



**FUNCTION**



**SURVIVE**

Feel



# Question



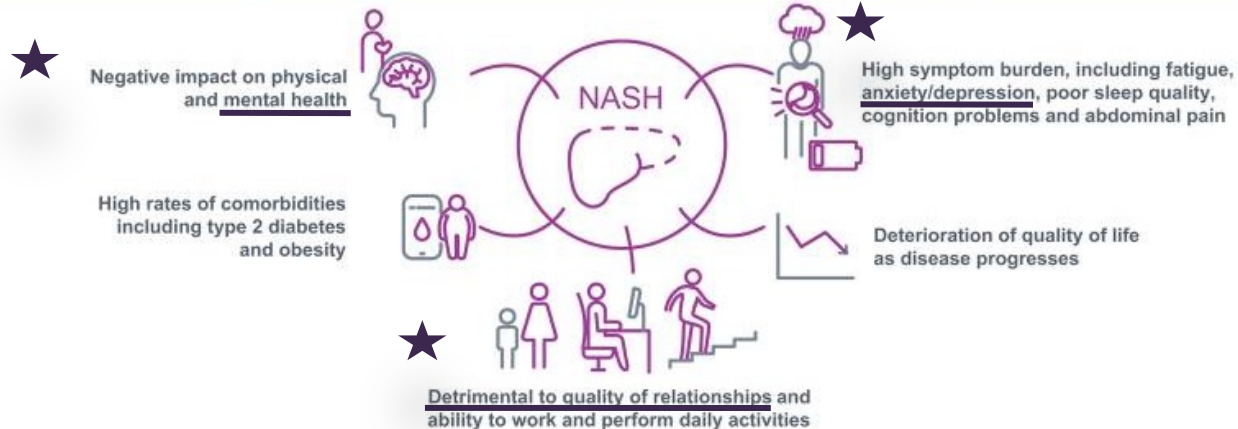
Do women with  
NAFLD/NASH  
FEEL differently?



# The burden of non-alcoholic steatohepatitis: A systematic review of health-related quality of life and patient-reported outcomes




Younossi, *et al.*

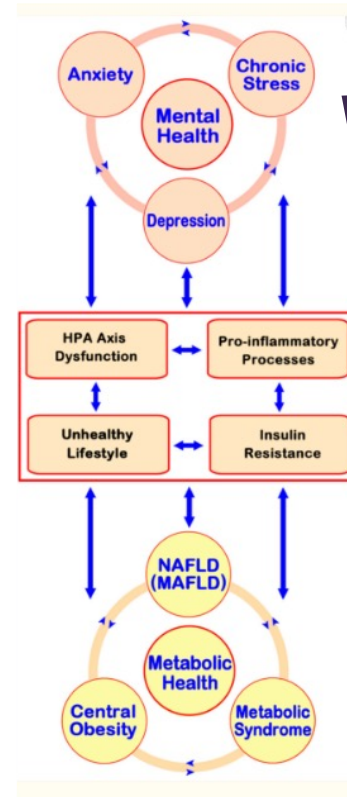
NASH is associated with a significant HRQoL burden that begins early in the disease course and increases with disease progression

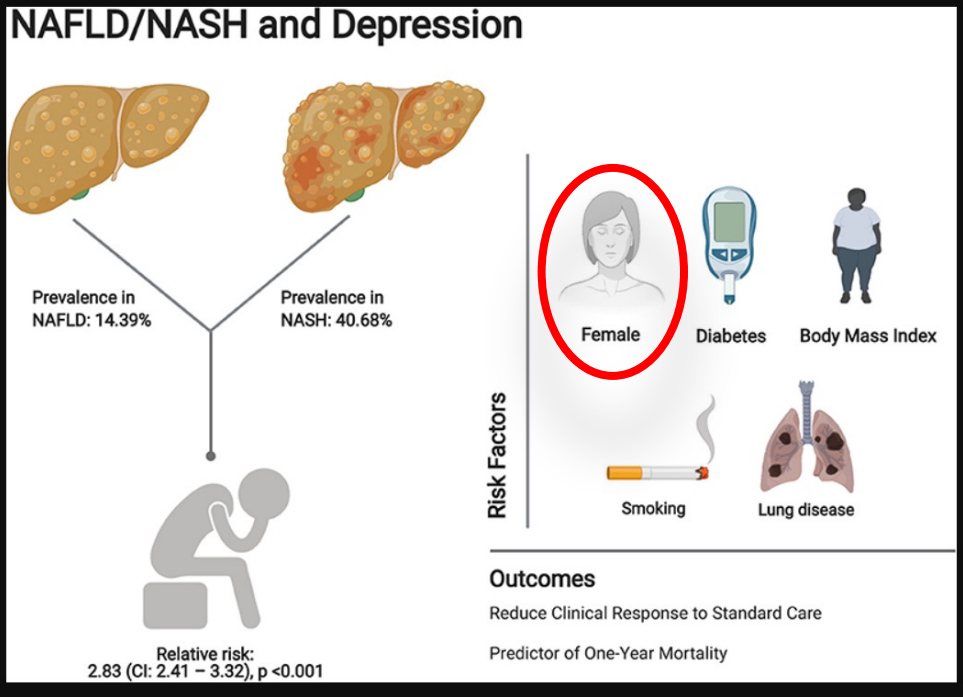


Review

## Non-Alcoholic Fatty Liver Disease (NAFLD) and Potential Links to Depression, Anxiety, and Chronic Stress

Sue Shea <sup>1,2</sup>, Christos Lionis <sup>3</sup> , Chris Kite <sup>2,4,5</sup> , Lou Atkinson <sup>2,6</sup> , Surinderjeet S. Chaggar <sup>7</sup>, Harpal S. Randeva <sup>1,2,\*,†</sup> and Ioannis Kyrou <sup>1,2,5,8,9,\*,†</sup>

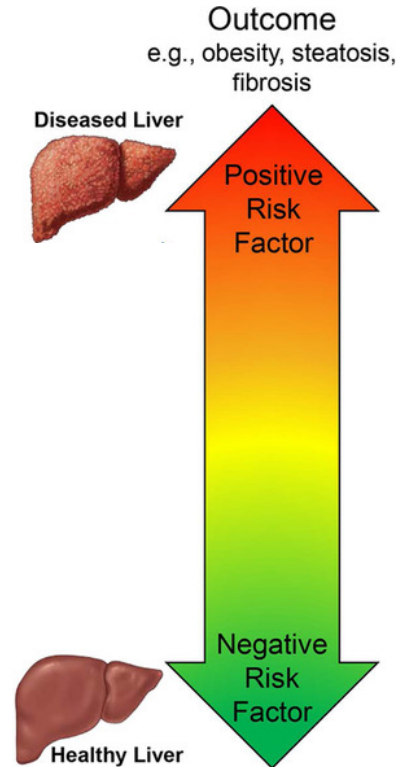






## Associations of depression, anxiety and antidepressants with histological severity of nonalcoholic fatty liver disease

Nagy A. Youssef, Manal F. Abdelmalek, Martin Binks, Cynthia D. Guy, Alessia Omenetti, Alastair D. Smith, Anna Mae E. Diehl, Ayako Suzuki



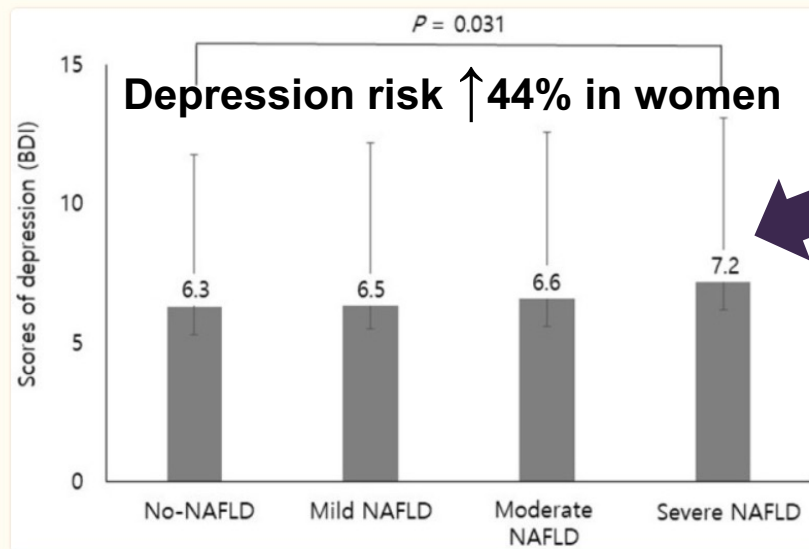
# Association Between Anxiety and Depression and Nonalcoholic Fatty Liver Disease

Jan 2021

Ji Min Choi<sup>1</sup>, Goh Eun Chung<sup>1\*</sup>, Seung Joo Kang<sup>1</sup>, Min-Sun Kwak<sup>1</sup>, Jong In Yang<sup>1</sup>, Boram Park<sup>2</sup> and Jeong Yoon Yim<sup>1</sup>

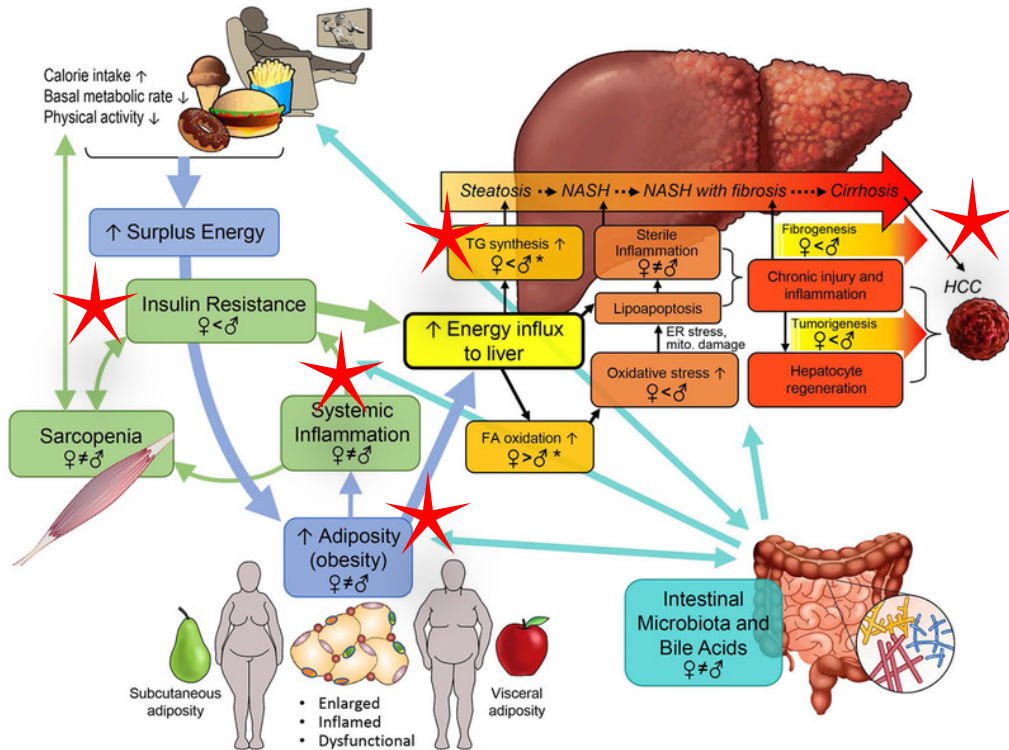
<sup>1</sup> Department of Internal Medicine and Healthcare System Gangnam Center, Seoul National University Hospital, Seoul, South Korea, <sup>2</sup> Department of Public Health Sciences, Seoul National University, Seoul, South Korea

- 25,333 Korean adults
- Retrospective
- Depression index increased directly with severity of hepatic steatosis





# Function & Survive



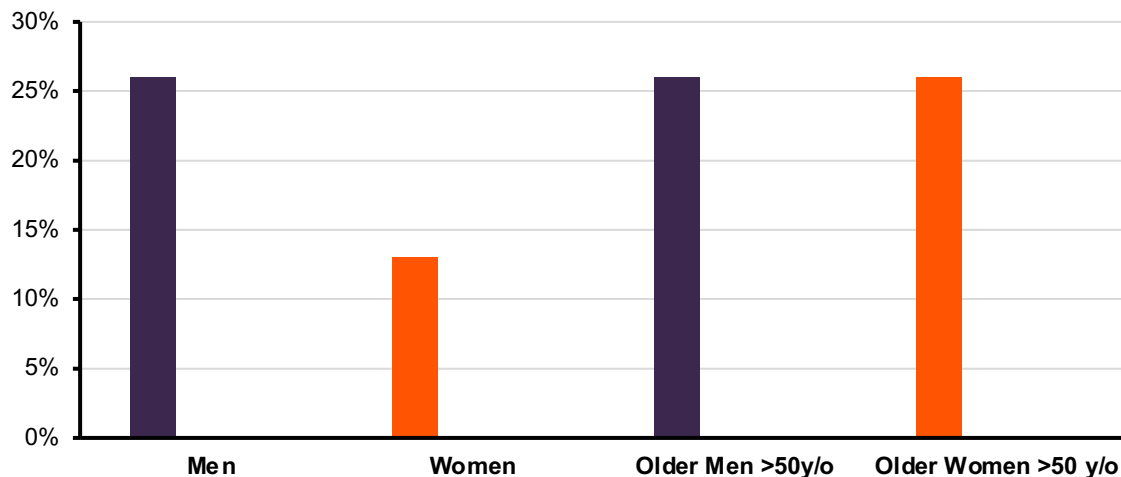
## REVIEW ARTICLE

# Gender Differences in Nonalcoholic Fatty Liver Disease

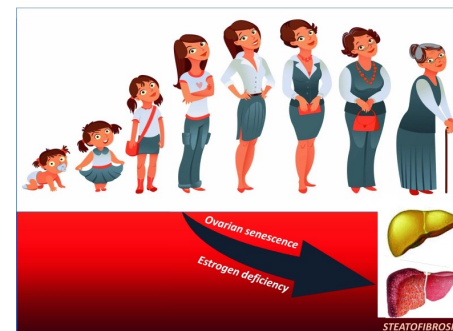
Aabha Nagral<sup>1</sup>, Manisha Bangar<sup>2</sup>, Sherna Menezes<sup>3</sup>, Shobna Bhatia<sup>4</sup>, Nazish Butt<sup>5</sup>, Jhumur Ghosh<sup>6</sup>, Jayani Harshika Manchanayake<sup>7</sup>, Mamun Al Mahtab<sup>8</sup>, Shivaram Prasad Singh<sup>9</sup>

July 2022

## Prevalence of NAFLD in Men and Women (Asian Studies)



- Estrogen may be protective:
  - ↓insulin resistance
  - ↓triglyceride synthesis
  - ↑ free fatty acid oxidation
- The increased risk of NAFLD in postmenopausal women is due to decreased estrogen





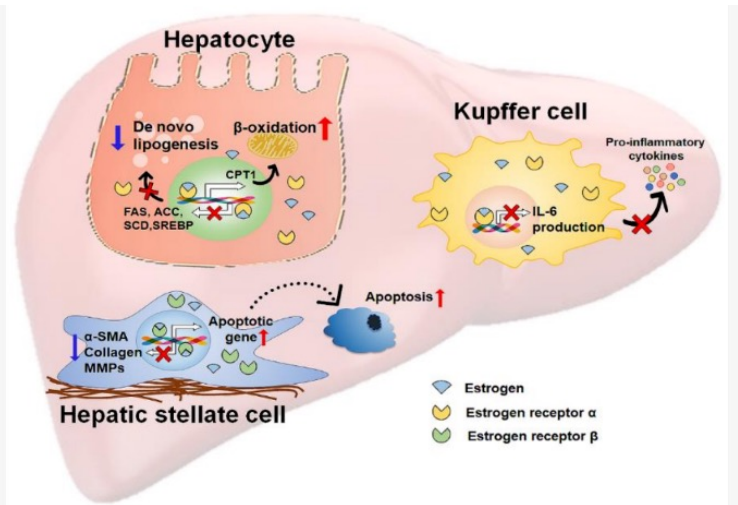
## Gender and Menopause Impact Severity of Fibrosis Among Patients With Nonalcoholic Steatohepatitis

2014

Ju Dong Yang,<sup>1</sup> Manal F. Abdelmalek,<sup>2</sup> Herbert Pang,<sup>3</sup> Cynthia D. Guy,<sup>4</sup>  
Alastair D. Smith,<sup>2</sup> Anna Mae Diehl,<sup>2</sup> and Ayako Suzuki<sup>1,2,5</sup>

- 541 adult patients (Duke University)
  - ACOR\* and 95% CI of having greater fibrosis severity
- Men: Women (Age <50)
  - 1.8 (1.1, 2.9) (P = 0.02)
- Men: Women (Age ≥50)
  - 1.2 (0.7, 2.1) (P = 0.59)

\*Adjusted cumulative odds ratio



Men are at a higher risk of having more severe fibrosis compared to women **before** menopause, while postmenopausal women have a similar severity of liver fibrosis compared to men.

ORIGINAL ARTICLE

## Gender disparities in liver transplantation for nonalcoholic steatohepatitis

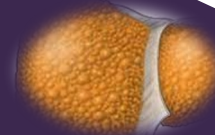
Veronica M. Loy  [Carroll](#)

First published

### Women with NASH cirrhosis:

\*↑ risk of death on the LT waiting list

\*Less likely to receive LT



- Nonalcoholic steatohepatitis (NASH) was present in more women than men throughout the study period.
- Transplantation was less common among women with NASH (52.4% vs 64.3%),
- Women were more likely to experience death on the waiting list (17.1% vs 11.4%).

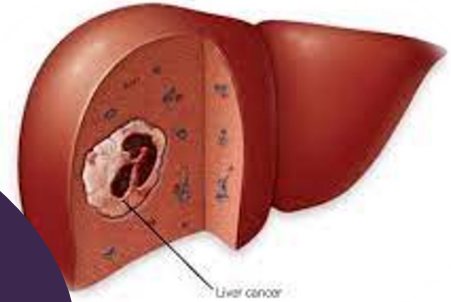
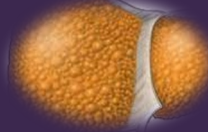
## Gender differences in hepatocellular carcinoma: disparities in nonalcoholic steatohepatitis and liver cancer

Eric M. Wu<sup>1</sup>, Linda L. Wong<sup>1</sup>, Brenden Kalathil<sup>2</sup>

- HCC (hepatocellular carcinoma) is the 4<sup>th</sup> leading cause of death in the United States
- Males are more likely to die from liver cancer
  - 1206 HCC deaths in 2014
  - 307 (25%) were

## Women (HCC)

- Older
- NAFLD/NASH
- Less Likely Transplanted
- *Non cirrhotic?*



# Summary

## NAFLD/NASH Lessons Learned From the Ladies' Liver?



**FEEL**



**FUNCTION**



**SURVIVE**

- Sex differences in NAFLD/NASH exist
- Sex differences may impact...
  - Clinical Research Targets
  - Practice Guidelines
  - Tailored or precision medicine practice considerations