

*“I believe every patient needs a physician who will
be an advocate to
help them regain
their health”.*

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NO DISCLOSURES



WOUND CARE AND THE 6 PILLARS OF LIFESTYLE MEDICINE



Learn **HOW** Stress, Exercise, Diet, Positive Emotion, Sleep, and Substance abuse effective wound healing.

Learn to **APPLY**, educate , and or refer a patient to appropriate auxiliary healthcare providers for a complete wound care approach of chronic/complicated wounds.

LEARNING OBJECTIVES



WHY LIFESTYLE MEDICINE IS NEEDED IN ALL MEDICAL FIELDS

CREATE STRATEGY TO CHANGE
AMERICA'S HEALTHCARE SYSTEM
FROM PREDOMINANTLY 'SICK
CARE' MODEL TO FOCUSED ON
'WELLNESS AND DISEASE
PREVENTION'.

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J Dent Res 89(3):219-229, 2010

ABSTRACT

Wound healing, as a normal biological process in the human body, is achieved through four precisely and highly programmed phases: hemostasis, inflammation, proliferation, and remodeling. For a wound to heal successfully, all four phases must occur in the proper sequence and time frame. Many factors can interfere with one or more phases of this process, thus causing improper or impaired wound healing. This article reviews the recent literature on the most significant factors that affect cutaneous wound healing and the potential cellular and/or molecular mechanisms involved. The factors discussed include oxygenation, infection, age and sex hormones, stress, diabetes, obesity, medications, alcoholism, smoking, and nutrition. A better understanding of the influence of these factors on repair may lead to therapeutics that improve wound healing and resolve impaired wounds.

KEY WORDS: wound healing, inflammation, proliferation, tissue remodeling.

Factors Affecting Wound Healing

INTRODUCTION

The wound-healing process consists of four highly integrated and overlapping phases: hemostasis, inflammation, proliferation, and tissue remodeling or resolution (Gosain and DiPietro, 2004). These phases and their biophysiological functions must occur in the proper sequence, at a specific time, and continue for a specific duration at an optimal intensity (Table 1; Mathieu *et al.*, 2006). There are many factors that can affect wound healing which interfere with one or more phases in this process, thus causing improper or impaired tissue repair.

Wounds that exhibit impaired healing, including delayed acute wounds and chronic wounds, generally have failed to progress through the normal stages of healing. Such wounds frequently enter a state of pathologic inflammation due to a postponed, incomplete, or uncoordinated healing process. Most chronic wounds are ulcers that are associated with ischemia, diabetes mellitus, venous stasis disease, or pressure. Non-healing wounds affect about 3 to 6 million people in the United States, with persons 65 years and older accounting for 85% of these events. Non-healing wounds result in enormous health care expenditures, with the total cost estimated at more than \$3 billion *per year* (Mathieu *et al.*, 2006; Menke *et al.*, 2007).

Laboratory investigations and clinical studies have yielded a wealth of information about both normal and impaired wound healing. More recently, a great deal of research has been directed at understanding the critical factors that influence poorly healing wounds. While much remains to be learned, these studies may lead to therapeutics that will promote proper tissue repair and improve impaired wound healing. This review will discuss the many different factors that affect cutaneous wound healing and the potential cellular and molecular mechanisms involved.

Table 2. Factors Affecting Wound Healing

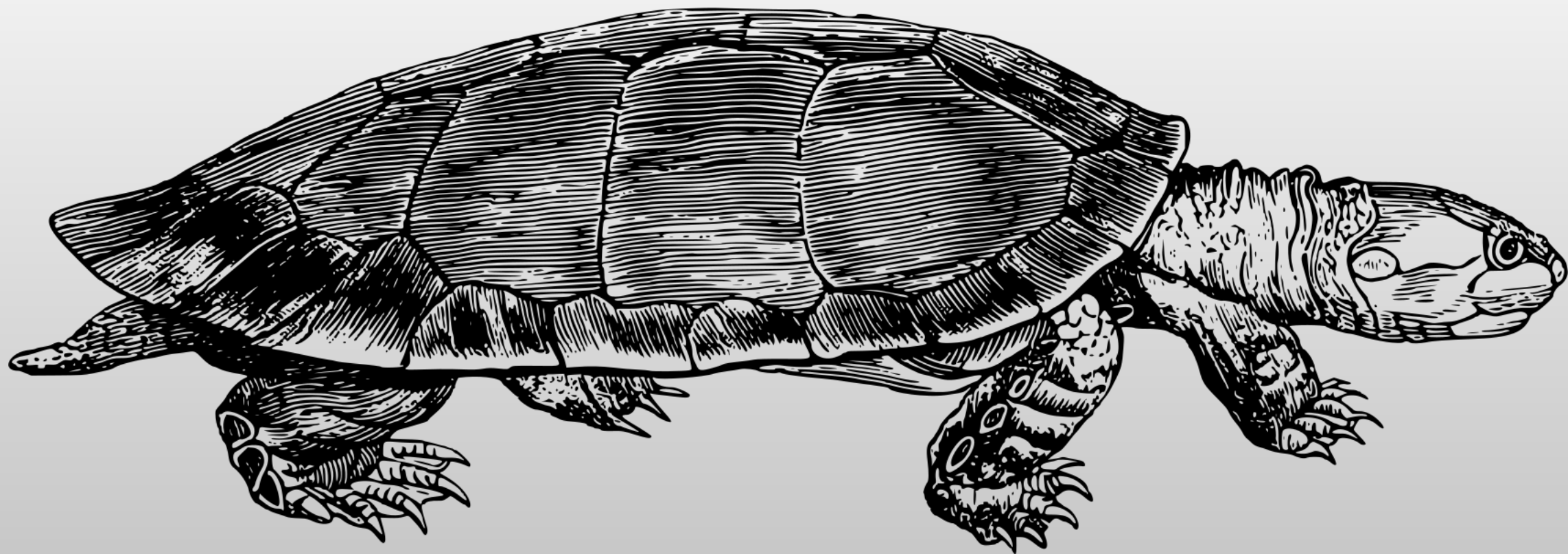
Local Factors	Systemic Factors
Oxygenation	Age and gender
Infection	Sex hormones
Foreign body	Stress
Venous sufficiency	Ischemia
	Diseases: diabetes, keloids, fibrosis, hereditary healing disorders, jaundice, uremia
	Obesity
	Medications: glucocorticoid steroids, non-steroidal anti-inflammatory drugs, chemotherapy
	Alcoholism and smoking
	Immunocompromised conditions: cancer, radiation therapy, AIDS
	Nutrition

FACTORS OF INFLUENCE IN WOUND CARE

SYSTEMIC

- AGE
- SEX HORMONES
- STRESS
- DIABETES
- MEDICATIONS
- OBESITY
- ALCOHOL & TOBACCO
- NUTRITION







“Evidence shows that the prevalence of depression is almost doubled in people with type 2 diabetes compared with people without diabetes.”

The prevalence of co-morbid depression in adults with Type 2 diabetes:
a systematic review and meta-analysis.

Ali S, Stone MA, Peters JL, Davies MJ, Khunti K
Diabet Med. 2006 Nov; 23(11):1165-73.

“Both clinicians and epidemiologists can expect individuals with diabetes to be twice as likely to be depressed than otherwise similar nondiabetic individuals in similar settings.”

The Prevalence of Comorbid Depression in Adults With Diabetes

Ryan J. Anderson, et al

Diabetes Care 2001 Jun; 24(6): 1069-1078.

<https://doi.org/10.2337/diacare.24.6.1069>

10

They "found that diagnosed diabetes was associated with the risk of future elevated depressive symptoms in people aged 52 to 64 years" and "that younger age was associated with higher levels of depressive symptoms in diabetes patients"..”

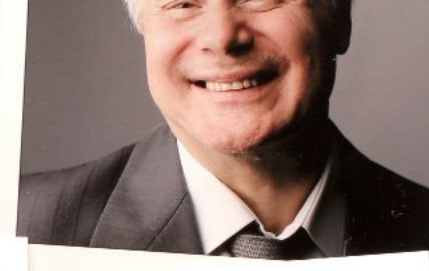
Is the association between depressive symptoms and glucose metabolism bidirectional?

Evidence from the English Longitudinal Study of Ageing.

Demakakos P, Zaninotto P, Nouwen A. Psychosom Med. 2014 Sep; 76(7):555-61.







13 simple tricks, will help you get a good nights sleep.

13 simple tricks, will help you get a good nights sleep.



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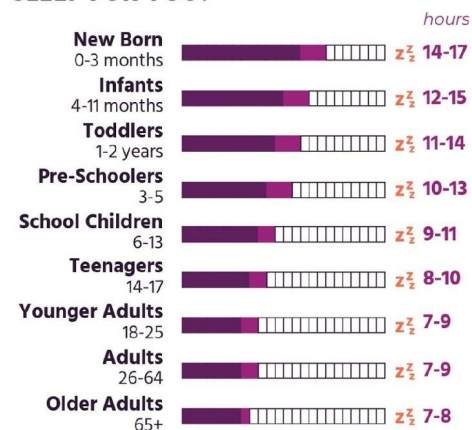
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- A circular sign with a red border and a large red 'X' over it. Inside the circle, there is a black silhouette of a wine glass and a black silhouette of a lit cigarette. Below the glass and cigarette, the word 'BEER' is written in white capital letters on a black rectangular background.

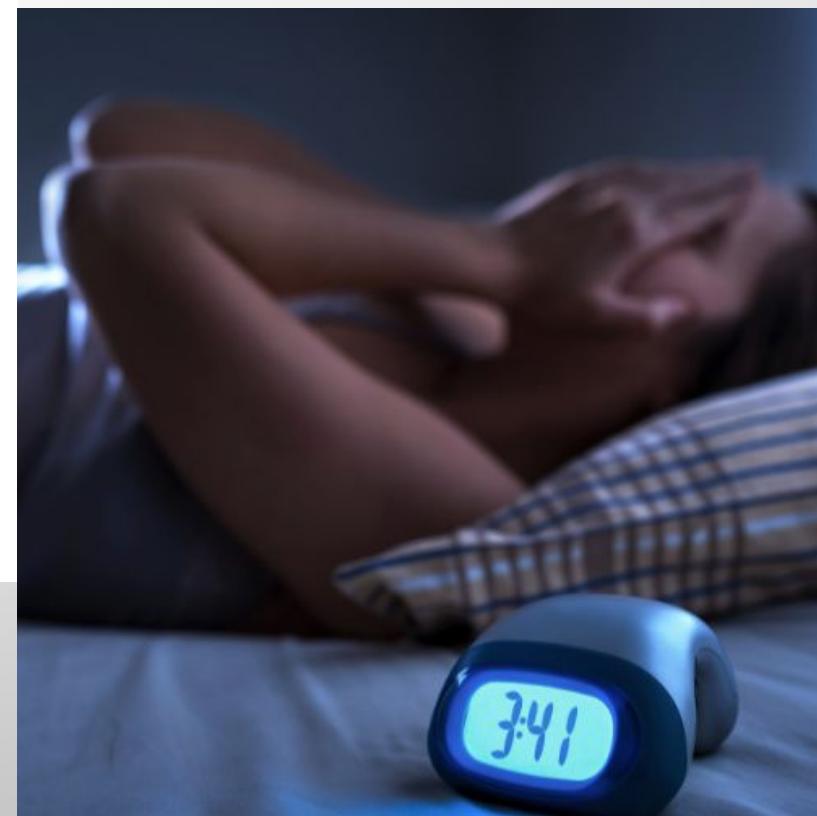
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- ## WHAT'S THE RIGHT AMOUNT OF SLEEP FOR YOU?



Above are the current evidence-based recommendations for each age group, use this as a guide for how many hours of sleep you need to feel your best.

Gooneratne NS, Vitiello MV.
Sleep in older adults: normative changes, sleep disorders, and treatment
options.
Clin Geriatr Med. 2014;30(3):591-627. doi:10.1016/j.cger.2014.04.007



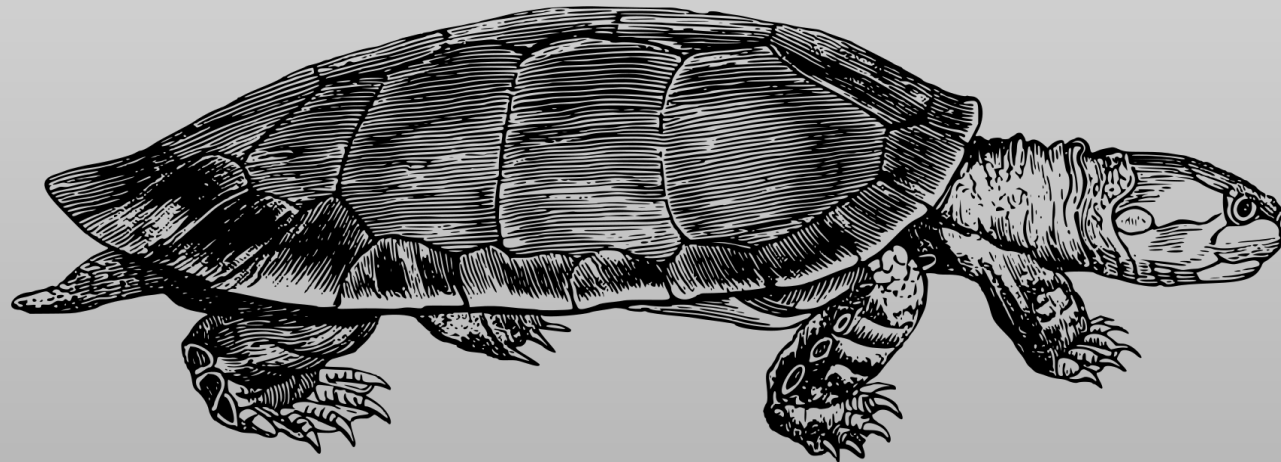


Low-intensity Exercise Accelerates Wound Healing



DIET

- PROTEIN -- “THE MOST IMPORTANT NUTRIENT FACTOR AFFECTING WOUND HEALING” --





RENAL CLINICAL GUIDELINES STATE THAT DIET CHANGES ARE A CRITICAL FIRST LINE TREATMENT FOR MANY CHRONIC CONDITIONS (E.G., DIABETES, OBESITY, HYPERTENSION), OFTEN BEFORE ANY MEDICATION IS PRESCRIBED.

STUDIES SUGGEST THAT LIMITING THE AMOUNT OF PROTEIN AND INCLUDING MORE PLANT-BASED FOODS IN THE DIET MAY HELP SLOW THE LOSS OF KIDNEY FUNCTION.

CKD EFFECT ON WOUND HEALING LEADS TO DISRUPTION OF KERATINIZATION KINETICS, LARGER EPITHELIAL GAP AS WELL AS DELAYED RATE OF GRANULATION.


THIS IS REINFORCED BY LEADING NATIONAL AND INTERNATIONAL ORGANIZATIONS AND BASED ON INNUMERABLE EVIDENCE-BASED STUDIES SHOWING DIETARY CHANGE HAS AN “A” RATING ON PATIENT IMPACT.

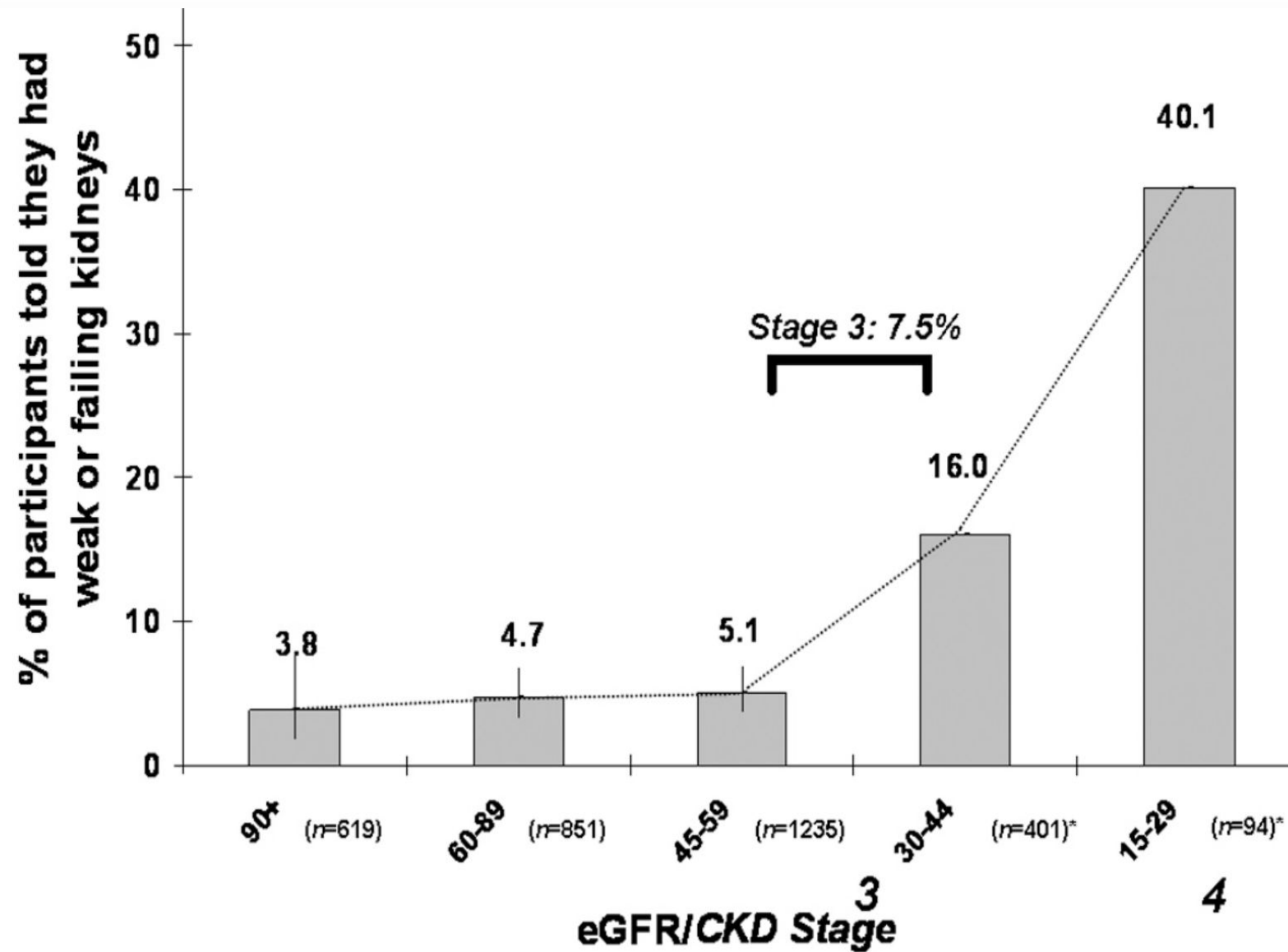
WHEN IS DIETARY CARE RECOMMENDED TO PATIENT WITH CRD?

13.3% IN PATIENTS WITH >12 MONTHS OF PRE-ESRD

33.3% OF NEW ESRD

THE UNITED STATES RENAL DATA SYSTEM (USRDS)
AND CHRONIC KIDNEY DISEASE (CKD)
CLINICAL PRACTICE RECOMMENDATIONS
FOR PRIMARY CARE PHYSICIANS
AND HEALTHCARE PROVIDERS





Percentage of U.S. population with albuminuria (single measurement) or CKD stage 3 or 4 who were aware of their disease, by eGFR. Data from the National Health and Nutrition Examination Survey 1999–2006. Bars, 95% CI. Albuminuria defined by albumin:creatinine ratio obtained from spot urine sample, >30 mg/g; GFR, estimated glomerular filtration rate by MDRD Study formula in $\text{ml/min}/1.73 \text{ m}^2$. Modified with permission from Plantinga et al. [4]. *No standard error estimates due to small sample size.

All causes deaths: 2,839,205

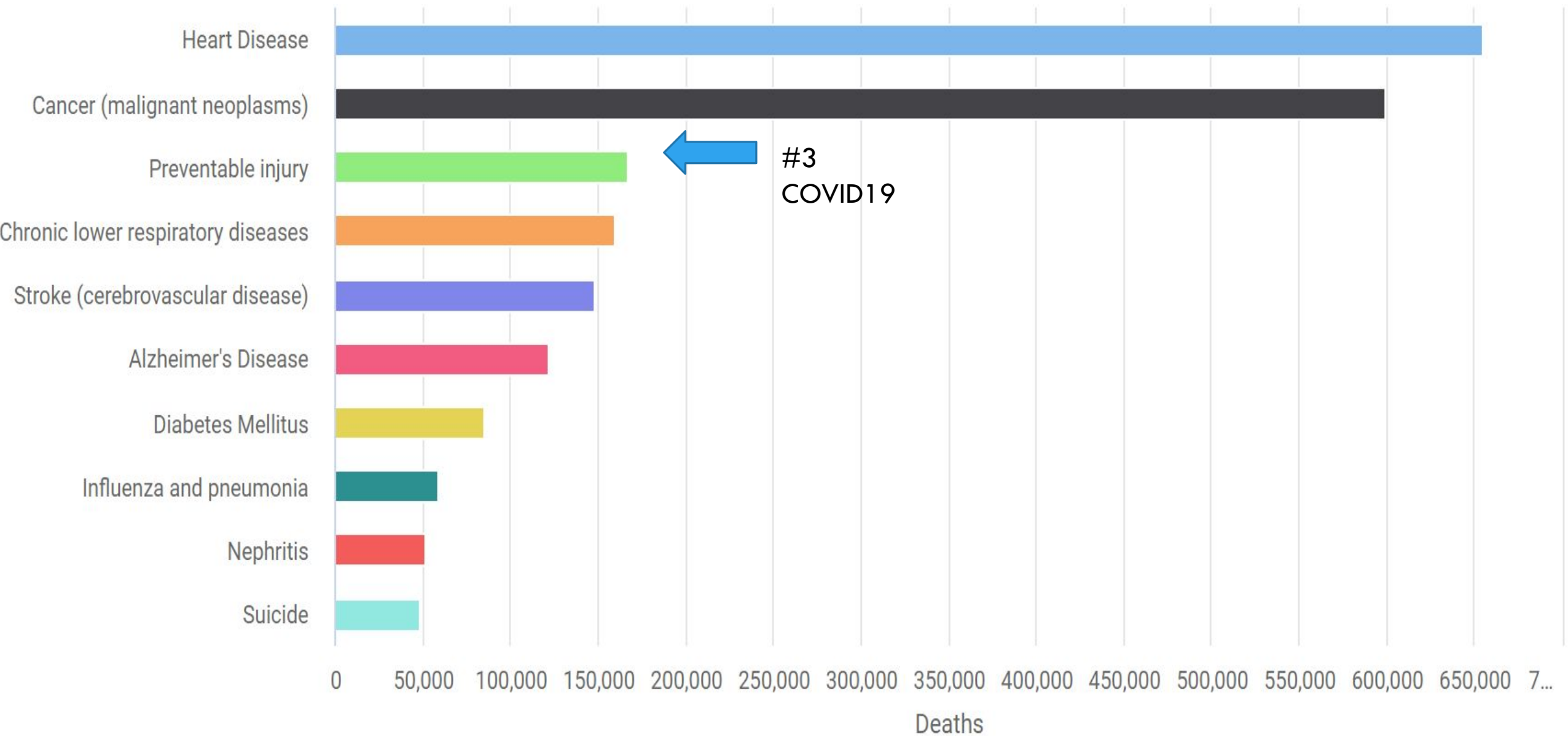
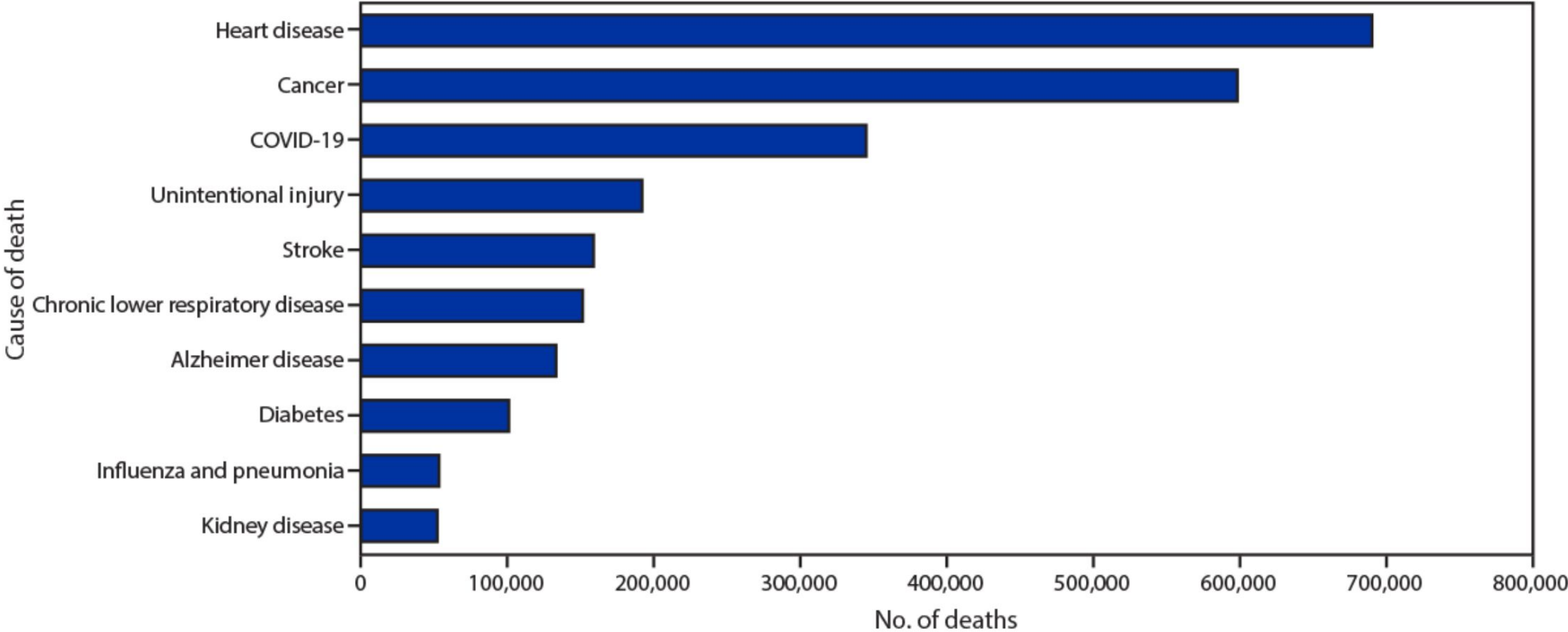


FIGURE 2. Provisional* number of leading underlying causes of death[†] — National Vital Statistics System, United States, 2020



* National Vital Statistics System provisional data are incomplete. Data from December are less complete due to reporting lags. Deaths that occurred in the United States among residents of U.S. territories and foreign countries were excluded.

SMART

SMART IS AN ACRONYM USED TO GUIDE
GOAL SETTING LM RX F&V.

- SPECIFIC: EXAMPLES
- MEASURABLE: SIZE, AMOUNT
- ACHIEVABLE: AGREED, ATTAINABLE
- RELEVANT: REASONABLE, REALISTIC
- TIME BOUND: TIME LIMITED,
TIME-FRAME

**SMARTER, INCLUDES
EVALUATED AND REVIEWED.

FITT

FITT IS AN ACRONYM CARDIOVASCULAR
AEROBIC EXERCISE GUIDELINES.

- FREQUENCY: HOW OFTEN
- INTENSITY: HOW HARD
- TIME: LENGTH OF TIME
- TYPE: WHAT KIND OF EXERCISE

SMART

RX: DIET

½ CUP WELL COOKED BEANS

- AS A REPLACEMENT FOR

½ OF A MEAT-BASED PROTEIN.

5 MEALS/Week FOR 1 MONTH

FITT

RX: EXERCISE

F: THREE TIMES PER WEEK

(TUES, THURS, SUNDAY)

I: MODERATE INTENSITY

(YOU CAN TALK, BUT NOT SING)

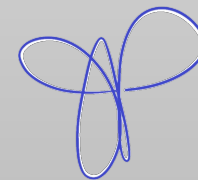
T: WALKING FOR 30mins

T: FOR 3 MONTHS



“MY GOAL IS TO
STUDY, TRAVEL,
DRINK, AND EAT
WITH OTHERS,
INSPIRING
POSITIVE
CHANGE.”

A Love of Food, Wine, & Medicine



Podiatric Surgical Fellow, Wound Care Expert, Founder,
Women Owned, Restaurateur, Sommelier
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