


Heart 101

Presented by:

University of Hawaii
John A. Burns School of Medicine,
Department of Native Hawaiian Health,
& the Ulu Network





**Module 1: Introduction to
the Cardiovascular
System and
Cardiovascular Disease
(CVD)**

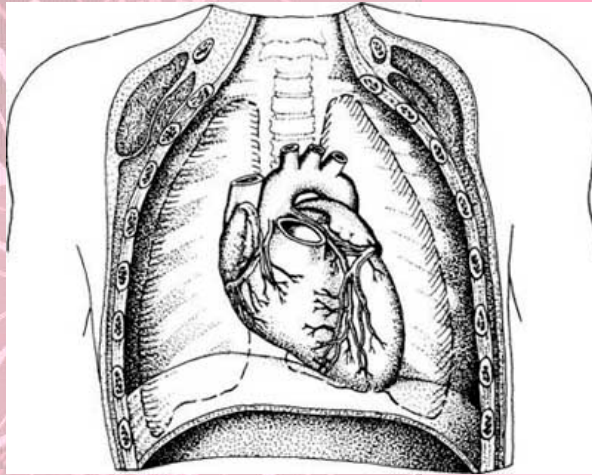


Objectives

By the end of this module, students will have learned. . .

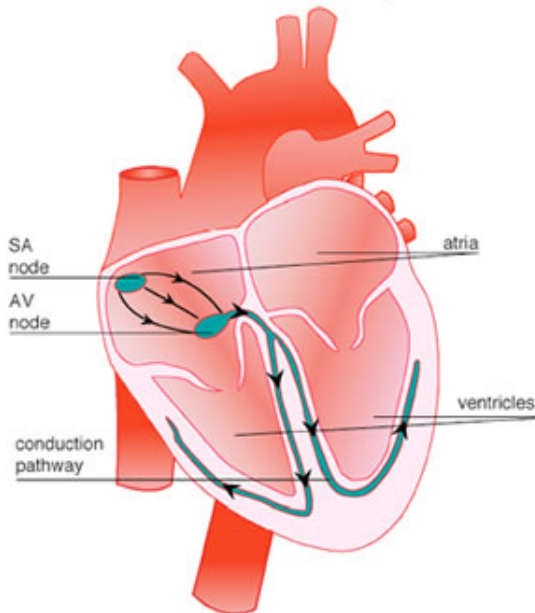
- An overview of the heart and the cardiovascular system
- What is cardiovascular disease
- Symptoms
- Who is diagnosed with cardiovascular disease
- Risk Factors
- Prevention

Overview of the Heart



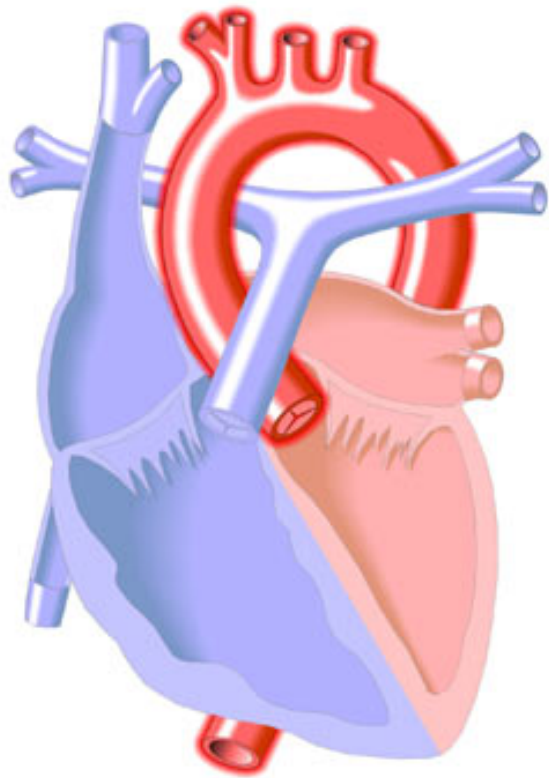
- Fist-sized muscular pump that moves blood around the body
- Heart situated 2/3 left of center & 1/3 right of center of the rib cage.
- Located in the mediastinum.
- Plumbing system
 - Moves blood through heart and body
 - Arteries carry blood Away from heart
 - Veins carry blood to heart
 - Heart → arteries → capillaries → veins → back to heart
 - 60 second cycle
- Electrical system
 - Triggers heart beat
 - Conducts electrical signal to contract heart muscles

Electrical conduction system



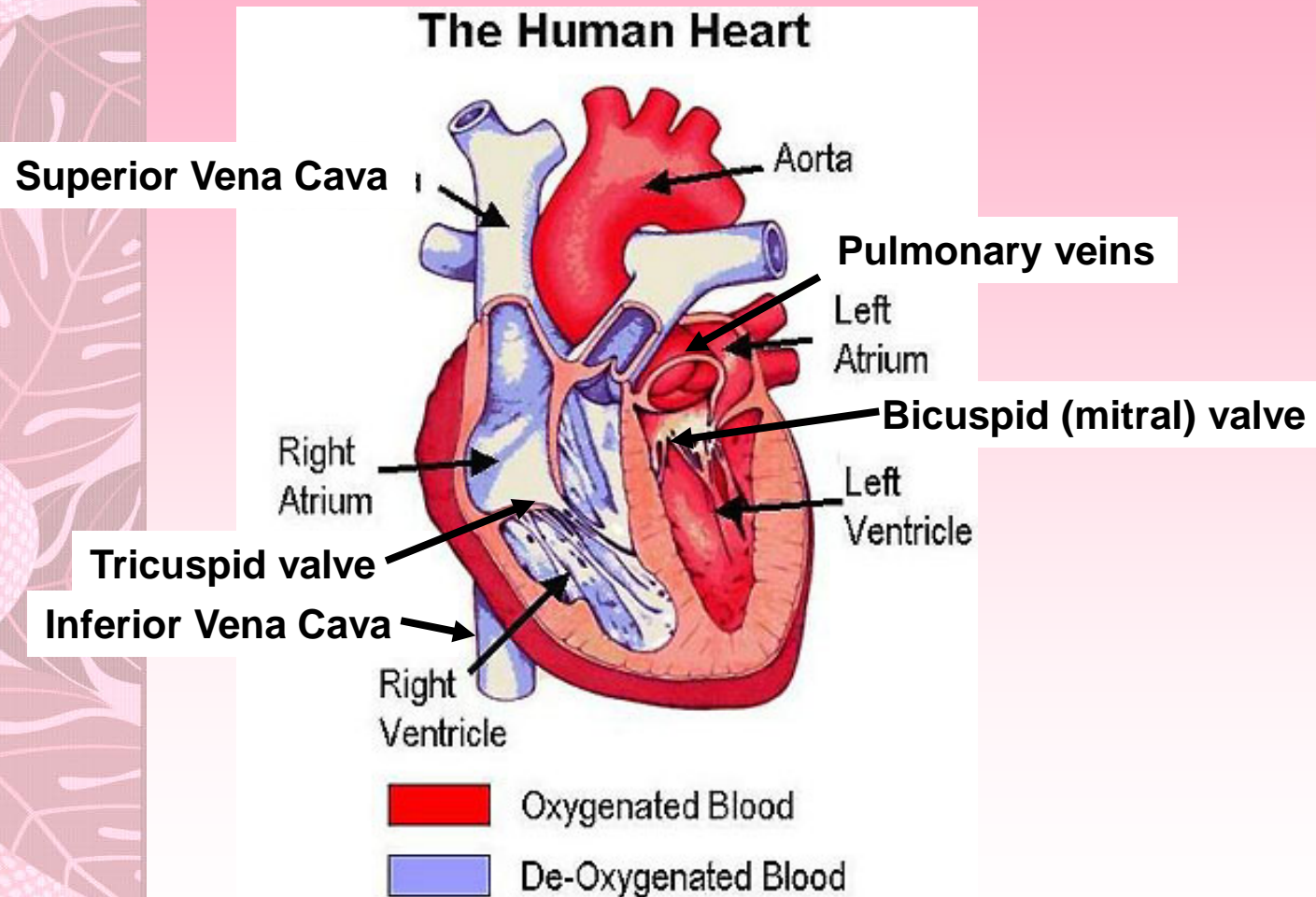
Overview of the Heart

- 2 different halves, 2 different functions




- **Right Heart** + pulmonary arteries + capillaries + veins = **PULMONARY CIRCULATION** (lungs)
- **Left Heart** + systemic arteries + capillaries + veins = **SYSTEMIC CIRCULATION** (body)

The Human Heart



Divisions of the heart

	Structure	Function	Receives blood from	Sends blood to
Right Atrium	- Tricuspid valve	- End systemic circulation	- Venae cava	- Right ventricle
Right Ventricle	- Tricuspid valve (top) - Semilunar valve (bottom)	- Start of pulmonary circulation	- Right atrium	- Lungs, via pulmonary trunk (arteries)
Left Atrium	- Bicuspid valve	- End of pulmonary circulation	- Lungs, via pulmonary veins	- Left ventricle
Left Ventricle	- Bicuspid valve (top) - Aortic valve (bottom)	- Start of systemic circulation	- Left atrium	- Rest of body, via aorta & systemic arteries



What is cardiovascular disease (CVD)?

- Heart Disease
 - Affects heart and blood vessels
 - Caused by buildup of cells and cholesterol (fat)
 - Plaques
 - Atherosclerosis
 - Obesity

References:

- American Heart Association, Cardiovascular disease and stroke. Available at www.americanheart.org/presenter.jhtml?identifier=79. Accessed July 24, 2003
- American Heart Association. *Heart Disease and Stroke Statistics – 2003 Update*. Dallas, Texas: American Heart Association 2002.



What are symptoms of CVD?

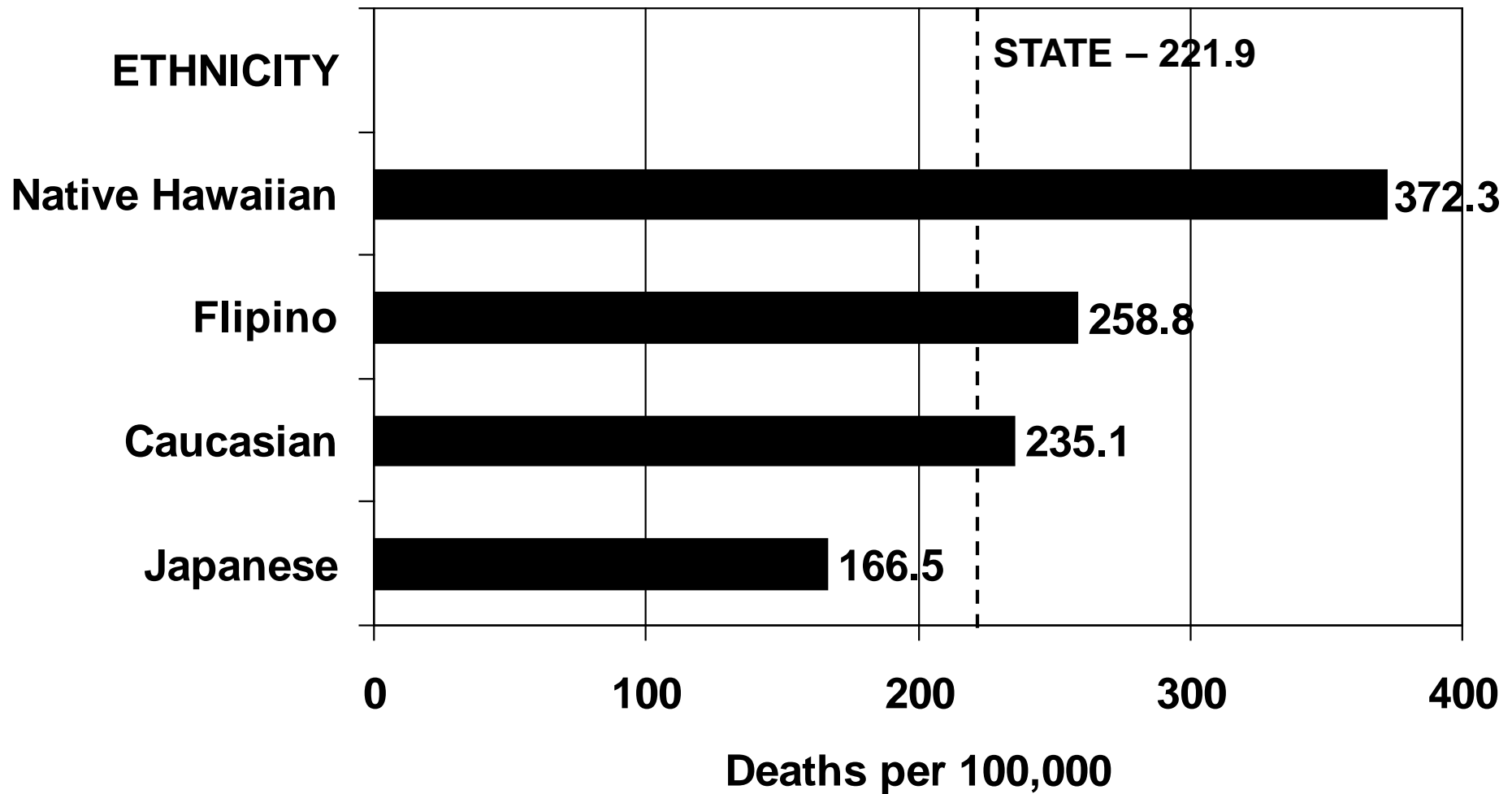
- Chronic, “silent,” no symptom disease
- But, the following can lead to cardiovascular disease:
 - High blood pressure
 - High cholesterol



Who is gets heart
disease?




Mortality Rates for CVD by Ethnicity, Hawaii 2000*



*Rates were age-adjusted based on the 2000 U.S. Census Population

SOURCE: Hawaii State Department of Health, Vital Statistics



Heart Disease and Native Hawaiians & Pacific Islanders (NHPI), and Asians

- Compared with Asians, NHPI are:
 - 50% more likely to die from heart disease
 - 50% more likely to smoke cigarettes
- Compared with Whites, NHPI are:
 - 20% more likely to be obese
 - 40% more likely to be diagnosed with heart disease

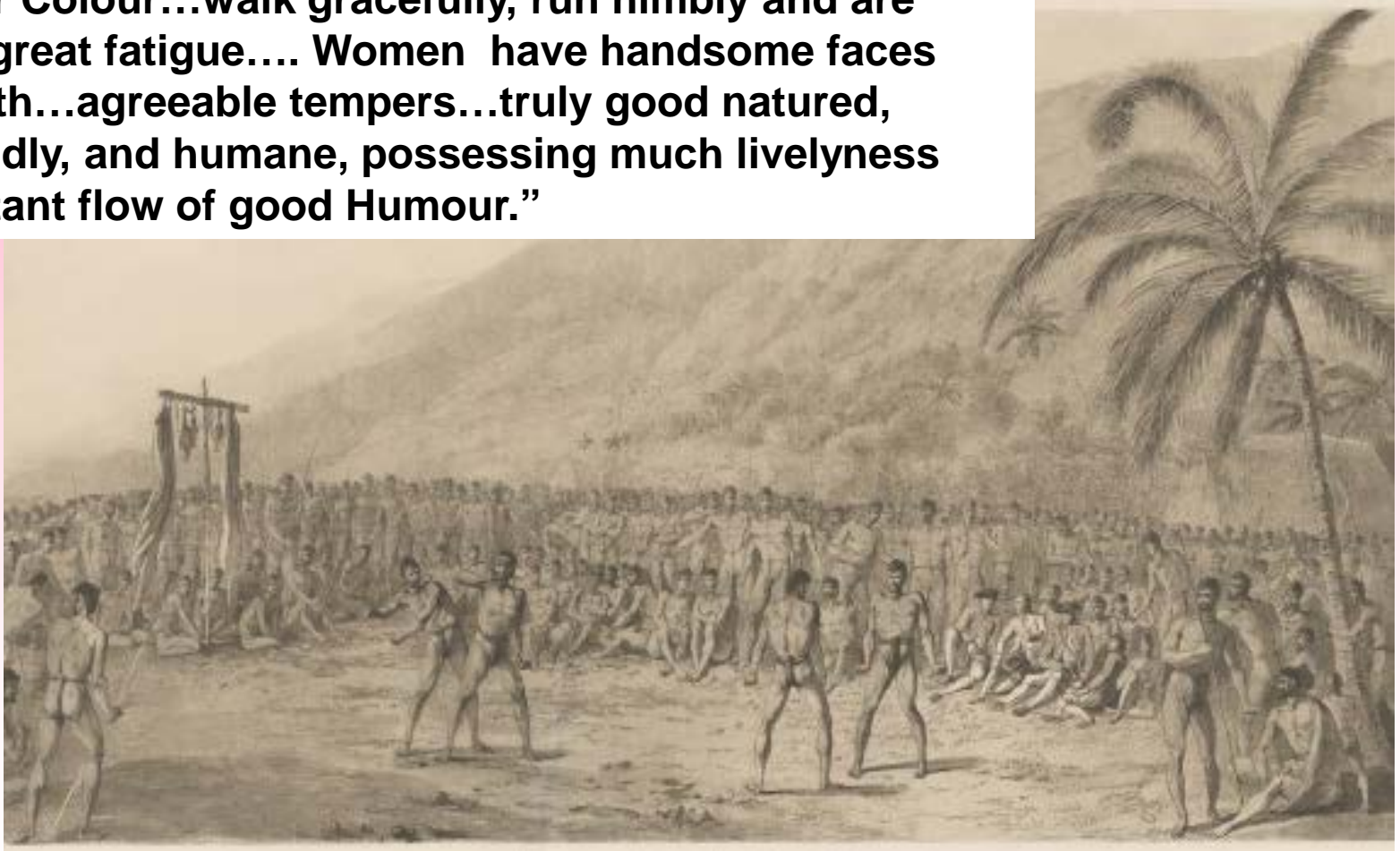
Traditionally...



- Past: healthy diets, active lifestyles
- Present: poor diets, sedentary lifestyle
 - Decline in health of Native Hawaiians and Pacific Islanders

First Western Contact, Capt Cook, Waimea, Kaua'i, January 19, 1778

“...Indians are above middle size, strong, well made...of a dark copper Colour...walk gracefully, run nimbly and are capable of great fatigue.... Women have handsome faces ...good Teeth...agreeable tempers...truly good natured, social, friendly, and humane, possessing much liveliness and a constant flow of good Humour.”



Third Western Contact, January 13, 1779, Kealakekua, at Makahiki



What are risk factors for cardiovascular disease?



Risk Factors Game

Risk factors that CANNOT be controlled

- Age
 - Men over the age of 55
 - Women over the age of 65
- Family history
- Ethnicity
- Gender



References:

American Heart Association, Risk factors and coronary heart disease. Available at www.americanheart.org/presenter.jhtml?identifier=4726. Accessed July 24, 2003

Chobanian AV, Bakris, GL, Black HR, et al. The Seventh Report on the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; the JNC 7 Report. *JAMA*. 2003;289:2560-2572.

Risk factors that CAN be controlled



- High blood pressure
- High cholesterol
- Diabetes
- Smoking
- Lack of physical activity
- Unhealthy diet
- Obesity and overweight
- Oral health



Diabetes




- Diabetes is a chronic disease where a person's body cannot make insulin or cannot use insulin properly
- What are the 3 key players in the disease?
- Without Diabetes:
 - Food \longrightarrow Sugar (Glucose) \longrightarrow Energy
(The food we eat gets changed to sugar (glucose) that our bodies can process and use as energy for everyday functioning)
- With Diabetes:
 - Food \longrightarrow Sugar (Glucose) ~~\longrightarrow~~ Energy
(The food we eat still gets changed to sugar (glucose) but our bodies **cannot** process and use it for energy)



Diabetes

- Diabetes type 2 is the more common of the two types of diabetes and is controllable.
- Even when the blood glucose levels are under control, diabetes increases the risk of heart disease.
- About 75% of those diagnosed with diabetes develop some form of heart disease.

What are other risk factors?

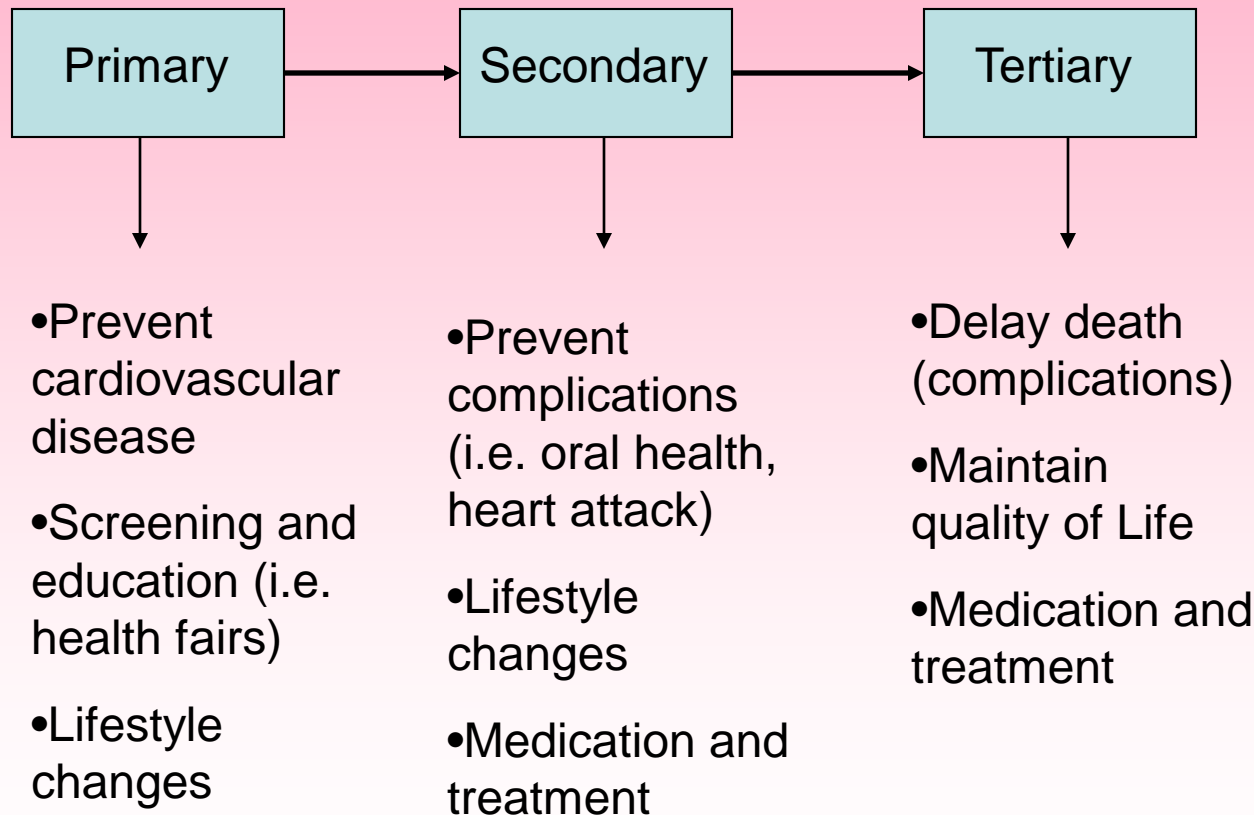
Risk Factor	Effect
Stress 	<ul style="list-style-type: none">• Too much stress may be at a greater risk of having coronary artery disease.• Blood pressure increases as a response to stress• Effect other risk factors:<ul style="list-style-type: none">– May overeat– Smoking
Alcoholism	<ul style="list-style-type: none">• Raises blood pressure• Cause heart failure and lead to stroke• Contribute to high triglycerides• Cancer and other diseases• Irregular heartbeats 
Hormone Replacement Therapy (HRT) 	Through clinical trials it has shown that some women are at an increased risk for blood clots, heart attack and stroke.




What are Ways to PREVENT Cardiovascular Disease?

Prevention

Areas/opportunities for Interventions with Cardiovascular Disease





What are ways to prevent cardiovascular disease?

Lifestyle changes

- Quit smoking and avoid secondhand smoke
- Maintain a healthy weight
- Participate in physical activity
- Eat a heart healthy diet
- Maintain good oral health

Medication and treatment

Quit Smoking



- Most preventable cause of disease and death in the U.S.
- Substantially increases risk for coronary heart disease in women who use oral contraceptives.

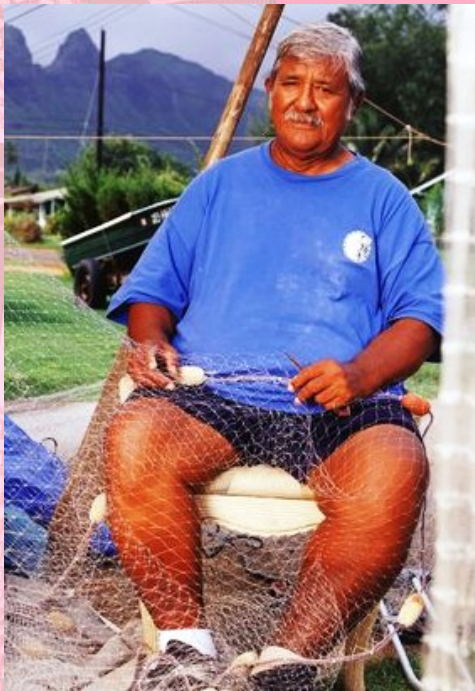
Blood pressure	Increases ↑
Exercise tolerance	Decreases ↓
Blood clotting	Increases ↑
HDL (good) cholesterol	Decreases ↓

Maintain a Healthy Weight

- **Being overweight or obese will increase:**
 - Heart's work
 - Blood pressure
 - Cholesterol
- **Being overweight or obese will decrease:**
 - HDL (healthy cholesterol)
- **Balance the calories you eat with the amount you use up each day**
- **A reasonable weight loss goal should be about 2 pounds a week**



Participate in Physical Activity



- Regular to moderate physical activity (at least 30 minutes/day, 5 days/week). . .
 - decreases risk of heart disease
 - reduces the amount of work of the heart does for a given workload



- Can help to control:
 - Cholesterol
 - Blood pressure
 - Diabetes
 - Obesity

Eat a Heart Healthy Diet

- Enjoy all foods in moderation
- There are no “forbidden” foods, but you must practice portion-/self-control
- Because there is no one perfect food, we must enjoy a **variety of foods** in moderation
 - Include fruits, vegetables, grains, low-fat or nonfat dairy products.
 - Limit intake of trans fatty acids
- Portion sizes are key to this concept



Lunch/Dinner Plate



Don't Forget.....



Eat your way to
5 A Day





Cooperative Extension Service
Department of Family & Consumer Sciences
Department of Human Nutrition, Food & Animal Sciences
College of Tropical Agriculture and Human Resources
University of Hawaii at Manoa

FOOD EDUCATION PROJECTS USER ZONES RESOURCES

- Site Map
- Term of Access and Use
- University of Hawaii
- College of Tropical Agriculture and Human Resources
- State of Hawaii
- United States Department of Agriculture (USDA)
- Sponsors & Collaborators
- Supplemental Nutrition Assistance Program - Department of Human Services
- Hawaii Department of Health (DOH)
- Women, Infants, & Children Program (WIC) - DOH
- Hawaii Department of Education (DOE)
- Office of Hawaii Child Nutrition Programs (DOE)
- School Food Services (DOE)
- Nutrition Program - Executive Office on Aging (DOE)
- Food and Nutrition Service - USDA

There is a link between nutrition, physical activity, and the well being of individuals and families. Historically established is the link between nutrition, a fundamental physical building block of human beings, and the well-being of our country. Food assistance programs have been based on these links.

NUTRITION EDUCATION FOR WELLNESS (NEW) is a statewide "umbrella concept" program that facilitates consumer foods and nutrition education.

Goals are:



To provide educational programs that increase the likelihood of healthy food choices consistent with the most recent dietary advice as reflected in the Dietary Guidelines for Americans, MyPyramid and Nutrition Facts.



To provide practical foods and nutrition education training via training and technical assistance and services delivery, materials adaptation and development, resources support, development of practical applied research, evaluation, and collaboration facilitation.



To safeguard the health and well-being of limited income households by promoting skills building and access to a healthy diet.

To provide statewide leadership and work with a diversity of organizations to achieve common goals.

Updated April 3, 2009



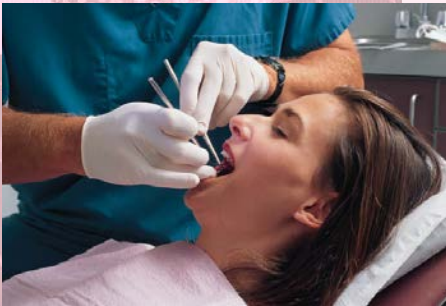
Healthy Meetings for Wellness




Nutrition Education for Wellness Survey

Maintain Good Oral Health

- **Gum disease can affect an individual's heart and brain.**
 - Bacteria found in the gum line can travel to the heart or brain and trigger heart disease, heart attack, and stroke.
- **Having advanced stages of gum disease will double one's risk of suffering a fatal heart attack.**





Ways to avoid gum disease

- Brush at least twice a day and floss once
- Floss properly
- Brush outside and inside of the teeth for two minutes
- Eat a balanced diet rich in a variety of nutrients.
- Limit snacks, especially sugary and starch based ones.
- Quit smoking (smoking raises risk of gum disease by 400%)
- Get a professional cleaning and checkup every six months



Case Study



Case Study – Changing one's lifestyle

Patient/client – You have been stressed at work with the deadlines lining up. On your way home for dinner you pick up fast food and when you reach home you end up drinking a few beers to relax. Since you have had these projects to complete you have not been able to even get outside for 5 minutes.

You go to the doctor and he/she has noticed that you have gained 15 pounds in the past 4 months, and noticed that your blood pressure & cholesterol are increasing. He/she refers you to the community health worker.



Case Study – Changing one's lifestyle

Community health worker –

Taking what you learned earlier today, work with the patient on a way to change his/her lifestyle to reduce hypertension, high cholesterol and reduce his/her risk for heart disease.

- Focus on lifestyle changes.

Review

In this module, we covered. . .

- An overview of the heart and the cardiovascular system
- What cardiovascular disease is
- The symptoms of cardiovascular disease
- Who is diagnosed with cardiovascular disease
- The risk factors of cardiovascular disease
- Prevention of cardiovascular disease



Questions or Comments