Development of a Physical Activity Intervention for Navajo Cancer Survivors

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Overview

- Background: Native Americans and Cancer
- Perceptions of cancer among Navajo cancer survivors
- Intervention Description & Progress Update
- Future Directions

American Indians (AI) and Cancer

- ↓ cancer mortality for White populations, ↑ for AI/AN men and women, 2001 to 2009 (CDC, 2016)
- AI/AN lowest 5-year survival rates of any group (59.0%) and only group w/o reductions in cancer mortality from 2001 to 2010 (Siegel, Ma, Zou, & Jemal, 2014).
- Most common cancers among AI/AN:
  - Lung, female breast, colorectal and prostate cancer
  - Death rates for some more common among Native populations (gallbladder, stomach, liver, and kidney cancers) (White et al., 2014).

Cancer is 2nd leading cause of death among Navajo Overall

Table 2: 15 Leading Causes of Death, Both Genders

Rank	Cause of Death	Count	Rate per 100,000	Percent of all deaths[3]
1	Unintentional Injuries	752	107.73	18.9
2	Cancer	506	72.49	12.7
3	Heart Disease[4]	485	69.48	12.2
4	Diabetes	228	32.66	5.7
5	Chronic Liver Disease & Cirrhosis	224	32.09	5.6
6	Influenza & Pneumonia	181	25.93	4.6
7	Suicide	119	17.05	3.0
8	Stroke	107	15.33	2.7
9	Septicemia	90	12.89	2.3
10	Dementia	84	12.03	2.1
11	Assault	83	11.89	2.1
12	Alcohol Dependence Syndrome	81	11.60	2.0
13	Renal Failure	77	11.03	1.9
14	Hypertensive Disease	59	8.45	1.5
15	Chronic Obstructive Pulmonary Disease (COPD)	49	7.02	1.2

Crude all-cause mortality rate is 32% higher for males than females. Unintentional Injuries account for nearly 1 in every 5 Navajo deaths. There are nearly 33% more Unintentional Injury deaths than Cancer deaths and 35.5% more than Heart Disease deaths; Foley et al. Navajo Nation Mortality Report, 2006-2009. Navajo Epidemiology Center. 2016.

Project Overview:
Two-phased Pilot Study

- **<u>Phase I (year 1-2): Qualitative Study:</u>**

  AIM 1: Assess current **physical activity habits, barriers, and preferences** among Navajo cancer survivors using a combination of focus groups and individual interviews

- **<u>Phase II (years 2-3): Pilot Physical Activity Intervention</u>**

  AIM 2: Evaluate the feasibility and effectiveness of a culturally and clinically sensitive physical activity intervention among Navajo cancer survivors

Recruitment

- 5 focus groups (N=4 Rural Chapter, 1 Flagstaff)
- 13 individual interviews (N=11 Flagstaff)
- 32 Navajo cancer survivors
- 8 relatives/ spouses/ close friends
- Adults
- Males and females
- Any prior cancer

Focus group/Interview Flow

- Focus groups included Navajo-speaking oncology nurse
- Began with Navajo introductions
- Study explanation and Q/A
- Consent
- Discussion guide questions
- Gratitude and Closing

Characteristics of Navajo cancer survivors participating in focus groups and interviews (N=32)

Characteristic	Mean or N	SD or %
Age, years	56.9	12.3
Sex		
Male	13	41%
Female	19	59%
Primary Language		
English	30	94%
Navajo	2	6%
Cancer Site		
Breast	10	31%
Colon	10	31%
Gynecologic, excl. breast[a]	3	9%
Gastrointestinal, excl. colon[b]	5	16%
Other[c]	4	13%
Time since diagnosis, years[d]	4.7	4.7

[a]Gynecologic, excluding breast cancer, represents ovarian and cervical cancers; [b]gastrointestinal, excluding colon, represents esophageal, gall bladder, and stomach; [c]prostate, kidney, hematologic cancers; [d]based on year of diagnosis by self-report, not exact date. Missing data: Age: 2; Time since diagnosis: 7.

Project Overview:
Two-phased Pilot Study (3 years)

- **Phase I (year 1): Qualitative Study:**

  AIM 1: Assess current **physical activity habits, barriers, and preferences** among Navajo cancer survivors using a combination of focus groups and individual interviews

- **Phase II (years 2-3): Pilot Physical Activity Intervention**

  AIM 2: Evaluate the feasibility and effectiveness of a culturally and clinically sensitive physical activity intervention among Navajo cancer survivors

Physical Activity (PA) and Cancer

- Up to 30-60% reduction cancer recurrence and mortality [2,3,4]
- Improved fatigue, quality of life, body composition, body image, & physical function among survivors [5]
- How much physical activity to reduce risk for colorectal and breast cancer?
  - Activity at moderate intensity (>4.5 MET)
  - Approx. 3-4 hours per week [6]
- None of these physical activity interventions among Native American Cancer Survivors

[1] Moore JAMA Int Med 2016; [2]Irwin Cancer Prev Res 2011; [3]Irwin J Clin Oncol 2008; [4] Meyerhardt J Clin Oncol 2006; [5] Schmitz Med Sci Sports Exerc 2010; [6]Wolin et al., 2009

Components of Physical Activity
(US PA Guidelines and ACSM Cancer Survivor Guidelines)

- **Aerobic/Endurance Training**
  - 150min Moderate OR 75 min Vigorous per week
  - OR…An equivalent mix of the two
- **Strengthening**
  - 2 days per week (non-consecutive days per muscle)
  - major muscle groups
  - 2 sets, 8-15 reps (depending on age and health)
- **Stretching**
  - 3-5 times on days that other exercises are performed
  - 10 to 30 seconds each
- **Balance Training**
  - 2 sets 8-15 reps for strengthening styles
  - Pure balance—increase time as you progress (i.e. 1 foot stand)

US Physical Activity Guidelines Advisory Committee Report 2008; Schmitz KH, Courneya KS, Matthews C, et al. ACSM roundtable on exercise guidelines for cancer survivors. Med Sci Sports Exerc. 2010;42(7):1409-1426.

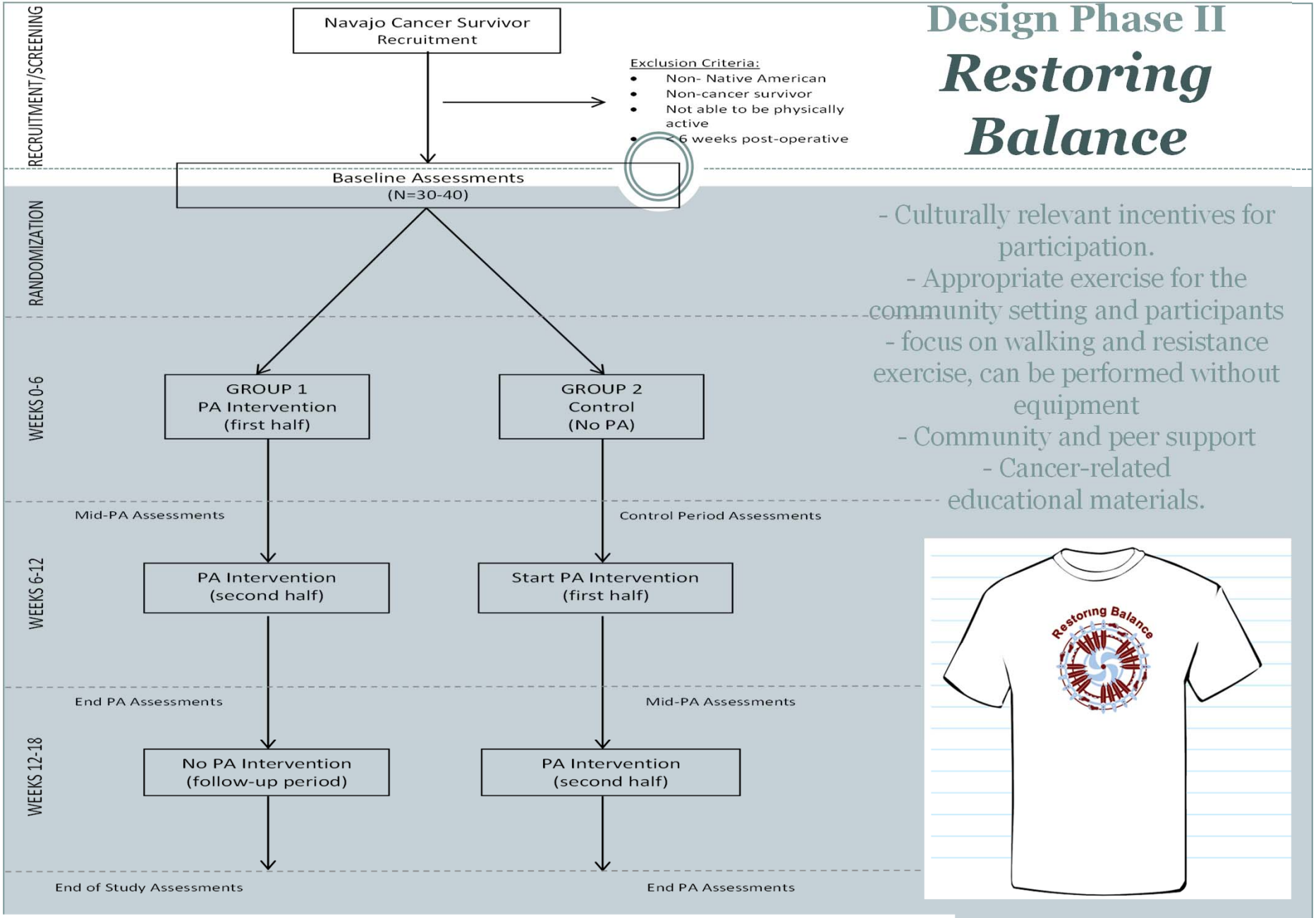

Figure 1. Physical Activity among Navajo Cancer Survivors Study Design

Repeat assessments include the following: Surveys: demographic/medical survey (baseline only), quality of life, physical activity, program satisfaction (end of PA intervention only); Measurements: aerobic capacity, functional mobility, anthropometry, physical activity (wearable device), metabolic markers

Restoring Balance Program

RESTORING BALANCE

HOME EXERCISE PROGRAM INSTRUCTIONS

Each week you will do the Day 1 of the exercise program with your trainer. The other days of the week, do your best to follow the exercise program handouts. Your trainer will go over each weeks' exercises with you and will show you the resistance exercises to do to build your muscles. If you do aerobic and resistance exercise on the same day, you should do your resistance exercises after you complete your aerobic exercise.

It is important to follow the program. If you don't do the exercises it will be very hard to keep up with your exercise group. If you want to additional exercise, you can, but keep the activity easy and fun. If you push yourself too hard, you will not get all the benefits of this program.

The aerobic exercise can be walking, jogging, running, or bicycling. On days when you are supposed to be active for 30 – 60 minutes you can do other activities like herding sheep, or playing basketball. Just be sure you keep moving! If you find that you cannot complete the full exercise session or intervals, start off at an easier pace the next time. It takes some practice to learn to pace yourself. You'll figure it out soon!

Take a friend or family member with you and make your aerobic exercise more fun. If they don't want to do the intervals, then you go ahead and do them and come back and rejoin your friend. Pretty soon they'll be joining you! People who exercise together have more fun, and build bonds that last.

Congratulations!

You are taking the steps to change your life and your health!! Remember, we are here to help you and support you. Call your trainer or the study team if you have any questions.

Contact us if you have questions!

Etta Yazzie, RN
(928) 221-4848 etta.yazzie@usoncology.com

The Partnership for Native American Cancer Prevention
(928) 523-8593

Contact Etta Yazzie, RN with Questions: (928) 221-4848 RESTORING BALANCE

EXERCISE WEEK 1: GETTING STARTED

**Day 1 Aerobic and Strength Exercise will be performed with your trainer*

AEROBIC (3x THIS WEEK)		I DID IT!
Day 1*	10 minute warm-up, 1 x 4 minute interval, 5 minutes cool down.	☐
Day 2	20-30 minute walk, jog or bike ride at steady comfortable pace.	☐
Day 3	10 minute warm-up, 2 x 3 minutes interval w 3 minutes easy walking in-between and 5 minutes cool down.	☐

You don't have to do aerobic exercise 3 days in a row.

If you find that you cannot complete the full exercise session or intervals, start off at an easier pace the next time. It takes some practice to learn to pace yourself. You'll figure it out soon!

STRENGTH (2 SETS EACH, 2x THIS WEEK) I DID IT! ☑

Do not do strength exercises 2 days in a row to give your muscles a rest.

	DAY 1		DAY 2	
	Set 1	*Set 2*	*Set 1*	*Set 2*
Calf raises: 15 reps; use counter support if needed	☐	☐	☐	☐
Theraband pull-aparts or seated back flies: 15 reps	☐	☐	☐	☐
Single leg balance: 30 seconds each leg	☐	☐	☐	☐
Dead bug: 5 arm/leg extensions	☐	☐	☐	☐


Calf Raises


Pull-aparts


Single leg balance


Dead bug

NOTES (including Progression / Regression):

Preliminary Baseline Characteristics

- N=13 Navajo cancer survivors have
  - 5 breast,
  - 3 colon/gastric,
  - 2 uterine/ovarian,
  - 2 multiple myeloma,
  - 1 other cancer
- Sex: 3M/10F
- Age: 55.5 years ±10.4
- BMI: 31.2kg/m^2±4.3
- Body fat: 42.7%±10.5
- Waist Circumference: 99.3cm±29.1
- HbA1c: 6.8±2.0
- 6min walk: 0.21mi±0.1
- PROMIS QOL 3.0±0.88
- PROMIS social isolation: 1.82±0.81

For: American Indian Science and Engineering Society National, Conference, Sept. Denver, Co.

Intervention Status

- Recruitment ongoing in Flagstaff and Leupp
- Working on further expansion
- Measurements ongoing
- Physical activity ongoing
- Final pilot measurements expected this Fall

Intervention Support

- Native Americans for Community Action
  - Facilitated by outreach
  - Well positioned to facilitate intervention implementation
  - Dedicated and convenient exercise space
  - Trainers for supervision, goal setting, encouragement
  - Space for NAU/UA researchers to conduct measurements
- Arizona Oncology Associates
  - Recruitment
  - Space to screen and consent
- NCI, NACP, NAU IRB (phase 1), UA IRB (phase 2 and full), Chapter House, Western Agency Council, NNHRRB, NACA board, NDOH,
- And Growing.....

Important Lessons for Tribal Research

- Design research that supports tribal goals
- Engage local partners in the research
- Ensure the research will benefit the community during the research process, not just afterwards
- Expand typical direct dissemination efforts
- Build community relationships
- Build community capacity
- Map out your timeline based on community meetings and approval processes

Acknowledgements

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  - Pearl Nez
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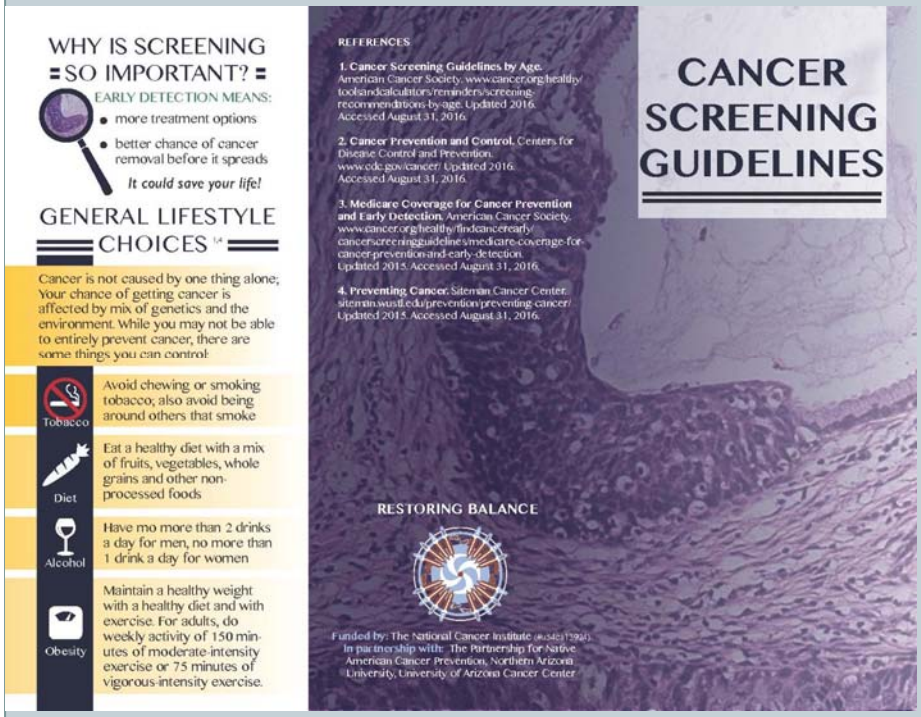
  - Jenille Montelongo-Rodriguez (CCC)
- Navajo Nation HRRB
- Chapter House
- Navajo Nation Western Agency Council
- Arizona Oncology Associates
- Native Americans for Community Action

Screening Handout



WHY IS SCREENING SO IMPORTANT?

EARLY DETECTION MEANS:

- more treatment options
- better chance of cancer removal before it spreads

It could save your life!

GENERAL LIFESTYLE CHOICES [1-4]

Cancer is not caused by one thing alone; Your chance of getting cancer is affected by mix of genetics and the environment. While you may not be able to entirely prevent cancer, there are some things you can control:

- **Tobacco:** Avoid chewing or smoking tobacco; also avoid being around others that smoke
- **Diet:** Eat a healthy diet with a mix of fruits, vegetables, whole grains and other non-processed foods
- **Alcohol:** Have mo more than 2 drinks a day for men, no more than 1 drink a day for women
- **Obesity:** Maintain a healthy weight with a healthy diet and with exercise. For adults, do weekly activity of 150 minutes of moderate-intensity exercise or 75 minutes of vigorous-intensity exercise.

REFERENCES

1. **Cancer Screening Guidelines by Age.** American Cancer Society. www.cancer.org/healthy/toolsandcalculators/reminders/screening-recommendations-by-age. Updated 2016. Accessed August 31, 2016.

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3. **Medicare Coverage for Cancer Prevention and Early Detection.** American Cancer Society. www.cancer.org/healthy/findcancerearly/cancerscreeningguidelines/medicare-coverage-for-cancer-prevention-and-early-detection Updated 2015. Accessed August 31, 2016.

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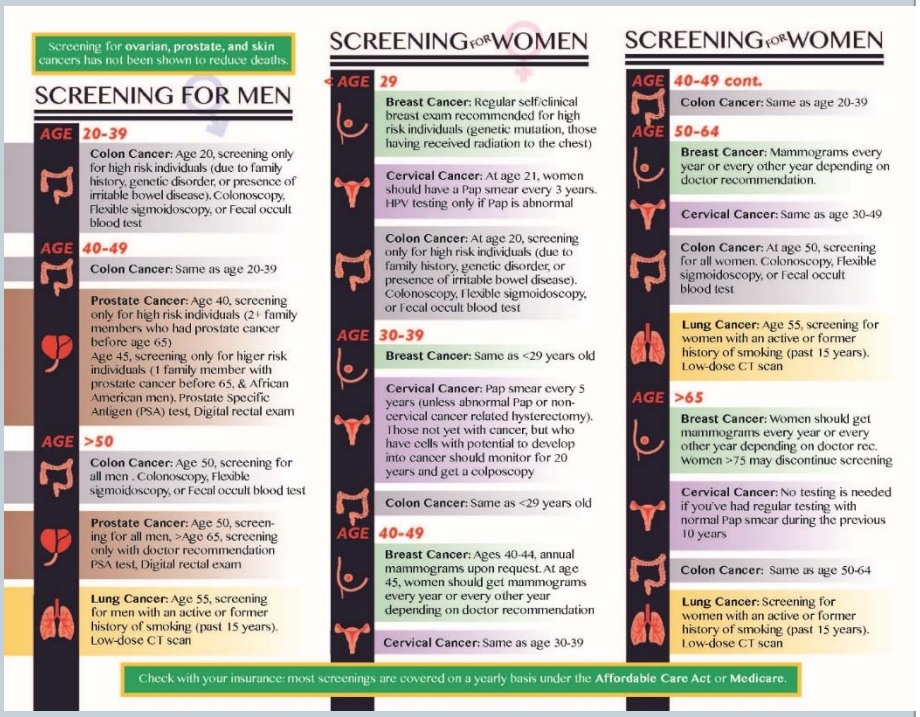
CANCER SCREENING GUIDELINES

RESTORING BALANCE

Funded by: The National Cancer Institute (#U48DP005049)
In partnership with: The Partnership for Native American Cancer Prevention, Northern Arizona University, University of Arizona Cancer Center



Screening for **ovarian, prostate, and skin** cancers has not been shown to reduce deaths.

SCREENING FOR MEN

AGE 20-39

Colon Cancer: Age 20, screening only for high risk individuals (due to family history, genetic disorder, or presence of irritable bowel disease). Colonoscopy, Flexible sigmoidoscopy, or Fecal occult blood test

AGE 40-49

Colon Cancer: Same as age 20-39

Prostate Cancer: Age 40, screening only for high risk individuals (2+ family members who had prostate cancer before age 65)
Age 45, screening only for higer risk individuals (1 family member with prostate cancer before 65, & African American men). Prostate Specific Antigen (PSA) test, Digital rectal exam

AGE >50

Colon Cancer: Age 50, screening for all men . Colonoscopy, Flexible sigmoidoscopy, or Fecal occult blood test

Prostate Cancer: Age 50, screening for all men, >Age 65, screening only with doctor recommendation PSA test, Digital rectal exam

Lung Cancer: Age 55, screening for men with an active or former history of smoking (past 15 years). Low-dose CT scan

SCREENING FOR WOMEN

< AGE 29

Breast Cancer: Regular self/clinical breast exam recommended for high risk individuals (genetic mutation, those having received radiation to the chest)

Cervical Cancer: At age 21, women should have a Pap smear every 3 years. HPV testing only if Pap is abnormal

Colon Cancer: At age 20, screening only for high risk individuals (due to family history, genetic disorder, or presence of irritable bowel disease). Colonoscopy, Flexible sigmoidoscopy, or Fecal occult blood test

AGE 30-39

Breast Cancer: Same as <29 years old

Cervical Cancer: Pap smear every 5 years (unless abnormal Pap or non-cervical cancer related hysterectomy). Those not yet with cancer, but who have cells with potential to develop into cancer should monitor for 20 years and get a colposcopy

Colon Cancer: Same as <29 years old

AGE 40-49

Breast Cancer: Ages 40-44, annual mammograms upon request. At age 45, women should get mammograms every year or every other year depending on doctor recommendation

Cervical Cancer: Same as age 30-39

SCREENING FOR WOMEN

AGE 40-49 cont.

Colon Cancer: Same as age 20-39

AGE 50-64

Breast Cancer: Mammograms every year or every other year depending on doctor recommendation.

Cervical Cancer: Same as age 30-49

Colon Cancer: At age 50, screening for all women. Colonoscopy, Flexible sigmoidoscopy, or Fecal occult blood test

Lung Cancer: Age 55, screening for women with an active or former history of smoking (past 15 years). Low-dose CT scan

AGE >65

Breast Cancer: Women should get mammograms every year or every other year depending on doctor rec. Women >75 may discontinue screening

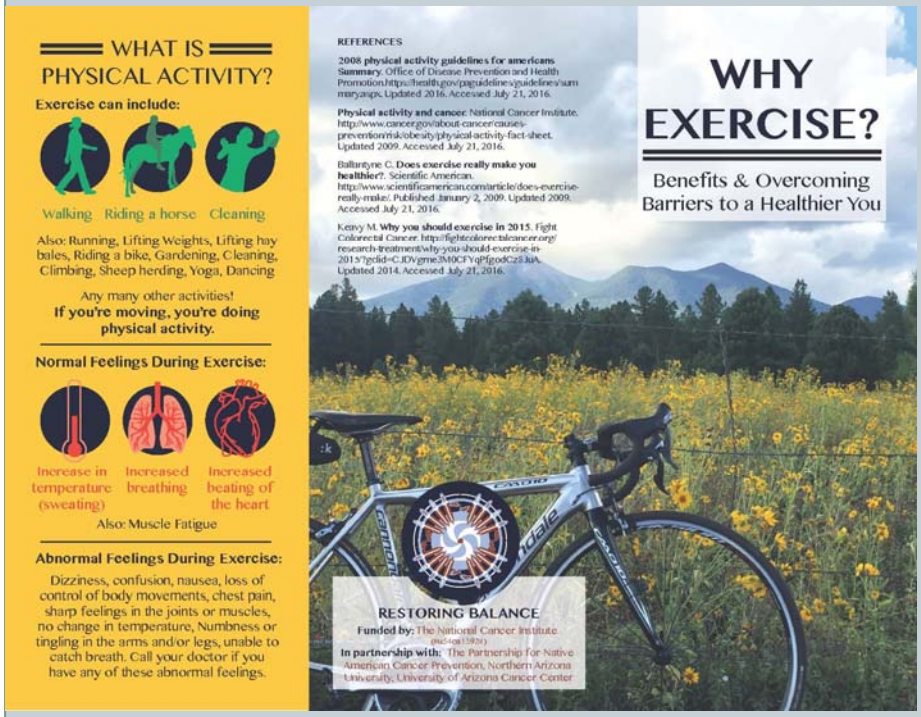
Cervical Cancer: No testing is needed if you've had regular testing with normal Pap smear during the previous 10 years

Colon Cancer: Same as age 50-64

Lung Cancer: Screening for women with an active or former history of smoking (past 15 years). Low-dose CT scan

Check with your insurance: most screenings are covered on a yearly basis under the **Affordable Care Act** or **Medicare.**

General Disease Prevention with Exercise



WHAT IS PHYSICAL ACTIVITY?

Exercise can include:

Walking Riding a horse Cleaning

Also: Running, Lifting Weights, Lifting hay bales, Riding a bike, Gardening, Cleaning, Climbing, Sheep herding, Yoga, Dancing

Any many other activities!
If you're moving, you're doing physical activity.

Normal Feelings During Exercise:

Increase in temperature (sweating) Increased breathing Increased beating of the heart

Also: Muscle Fatigue

Abnormal Feelings During Exercise:

Dizziness, confusion, nausea, loss of control of body movements, chest pain, sharp feelings in the joints or muscles, no change in temperature, Numbness or tingling in the arms and/or legs, unable to catch breath. Call your doctor if you have any of these abnormal feelings.

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WHY EXERCISE?

Benefits & Overcoming Barriers to a Healthier You

RESTORING BALANCE

Funded by: The National Cancer Institute
(NCI-136939)

In partnership with: The Partnership for Native American Cancer Prevention, Northern Arizona University, University of Arizona Cancer Center

BENEFITS OF EXERCISE

Weight loss

Increases "good cholesterol", decreases "bad cholesterol"

Prevents Disease

Decrease in risk of:
- Cancer (several types)
- Depression
- Arthritis
- Stroke
- Heart attack
- Falling
- Diabetes
- Acute illness

Disease Prevention

Decreases in:
- Blood pressure
- Inflammation (which contribute to heart disease)

Improvements in:
- bone density
- mood
- energy levels
- sleep quality
- memory

BENEFITS OF EXERCISE FOR CANCER

Reduces:
- risk of colon, breast, lung, prostate, and endometrial cancers
- cancer-related fatigue

Maintains:
- healthy bones
- muscles
- joints

Being inactive (watching TV, sitting around) increases risk of death

COMMON BARRIERS TO EXERCISE

No Transportation No time, Too busy Don't know how to exercise

CDC EXERCISE RECOMMENDATIONS

Avoid inactivity!
Some activity is better than none; any gives some health benefits

Do **2 hrs 30 min/wk of moderate-intensity**, or **1 hr 15 min/wk of vigorous-intensity** aerobic activity

For more health benefits, increase aerobic physical activity to **5 hrs/wk of moderate-intensity**, or **2 hrs 30 min/wk of vigorous intensity** aerobic physical activity

More exercise gives more health benefits

Moderate-intensity exercise includes:
- Biking <10 mph
- Brisk walking
- Roofing / Painting
- Hiking
- Gardening
- Dancing

Vigorous-intensity exercise includes:
- Jogging/Running
- Basketball
- Soccer
- Biking >10mph
- Swimming Laps
- Weight Lifting

Perform aerobic exercise in **episodes of at least 10 min & spread it through the week**

Do muscle-strengthening activities (such as lifting weights) **2 or more days/wk**

start lighter than you think you can do

HOW TO OVERCOME THESE BARRIERS

Bring family with you
to your exercise session.

Exercise with someone
(relative or friend),

Exercise is good for you.
Learn the benefits from your trainer.

Do the home exercises
your trainer gives you each week.

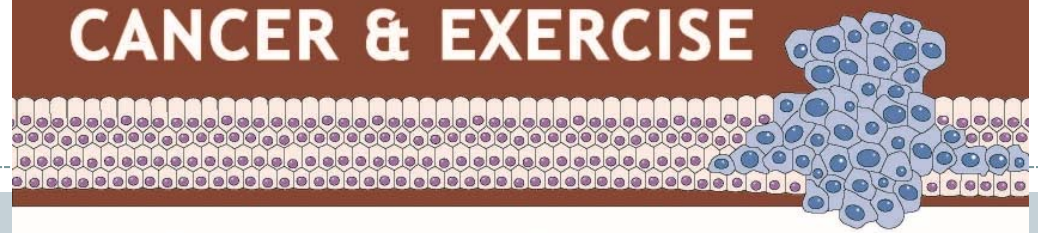
Make good use of your time.
Do your exercise when talking to friends and family.
Get the grand kids to do them with you.

Walk more. Drive less.

Get your family and friends to help you exercise.

Make exercise
part of your everyday routine.

CANCER & EXERCISE



WHAT IS CANCER?

Cancer is **uncontrolled growth** of some cells in the body.
Cancer cells invade healthy tissues in the same area or other areas of the body.
Cancer cells make it difficult for the body to function as it should.

Ats'íís bitł'óól dah díníséédh áádóó ba'át'e' hóló yileeh, doo béédhózingóó díníséédh. Hats'íís biyi'di łahgo hazhó'ó hats'íís nooséél dóó hasht'e náá'níłt yęę t'óó bitahjigóó díníséédh. Bee hats'íís nizhónígo háádoo'níłt yęę doo hazhó'ó naalnishda silíį'.

SHOULD I EXERCISE DURING / AFTER CANCER?

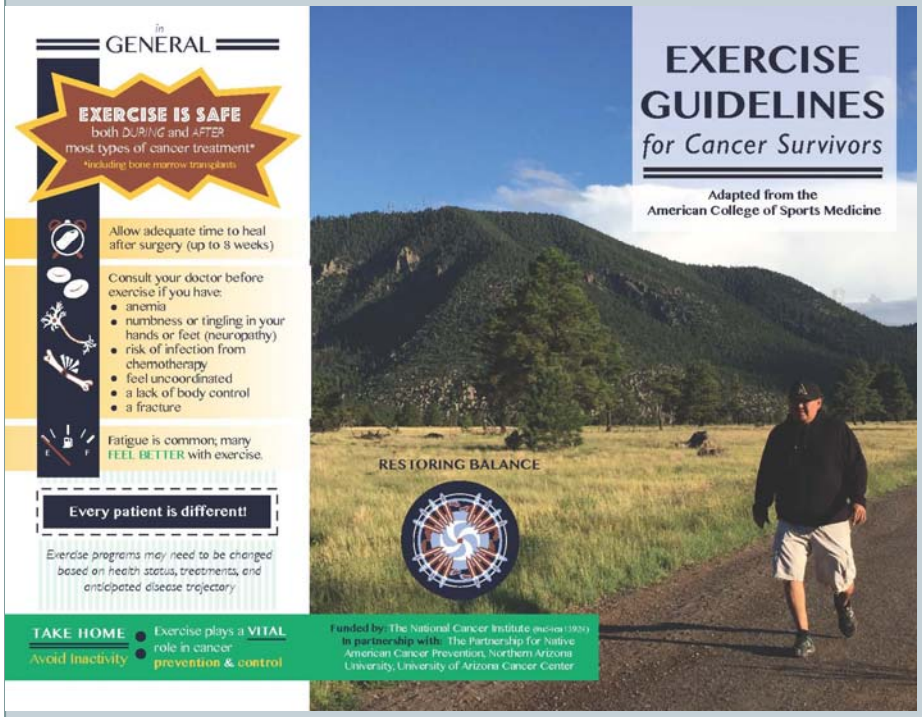
YES!

- Return to normal activities as soon as possible after surgery
- Work on resistance and flexibility exercises
- **Avoid Inactivity!!**
- Seak medical advice for individual prescription
- Exercise is safe during and after most treatments.
- Start slowly & Listen to your body
- Exercises maintains function, quality of life, and ⬇ fatigue

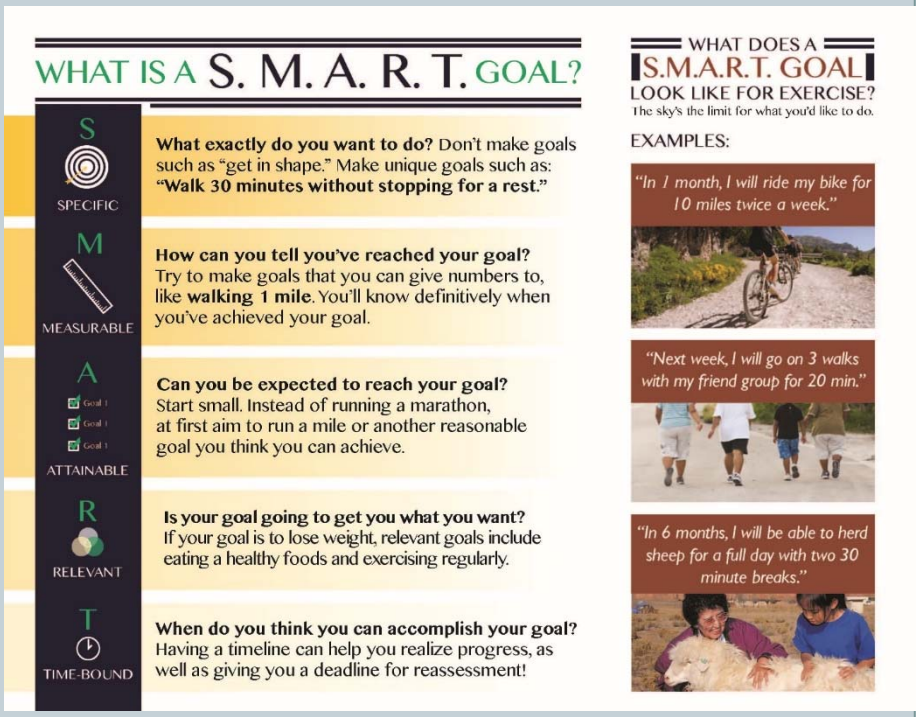
LOCAL RESOURCES

North Country Healthcare | Flagstaff (928) 522-9400 | Kingman (928) 718-4500 | Holbrook (928) 524-7200
Navajo Nation Breast and Cervical Cancer Prevention Program | Window Rock (928) 871-6348
Cancer Resource Center - Cancer Center of Northern Arizona | Flagstaff (928) 773-2261
Arizona Oncology Associates | Flagstaff (928) 773-2260
American Cancer Society | Flagstaff (928) 526-3800
University of Arizona Cancer Center | Phoenix (602) 406-8222
Tucscon (520) 694-2873

Cancer Exercise Guidelines



Goal Setting Support



Community Relations & Capacity Building

- Training and financial support of Native students in cancer prevention research
- Training non-Native students, faculty, staff in working with Native populations
- Chapter & Western Agency Council
- Navajo Epidemiology Department
- NNHRRB
- NACA
  - Contract
  - Training to expand local, sustainable expertise
- Arizona Oncology Associates

Funding Sources

- NIH/NCI: U54CA143924
- NIH/NCI: P30CA023074
- University of Arizona Faculty Seed Grant
- Undergraduate Biology Research Program HHMI 52006942
- Northern Arizona University BRIDGES to Baccalaureate NIGMS1R25GM102788-01
- UA Medical Student Research Training Grant (NIH #T35HL007479)

Extra slides

Timelines and Planning

- Determine which entities must approve your research, when they meet, and what forms and processes they require
- Stay up to date on tribal requirements
  - Example: Navajo Western Agency council requirement was added 2016
    - WAC Meetings are quarterly (in rotating locations)
    - Understand process to get on agenda; need a sponsor at the meeting
- Determine order of approval:
  - For Navajo, gain university IRB and local entities approval first
  - Other tribes may differ
- Complete tribal IRB forms/paperwork in addition to university forms and submit to appropriate IRB
  - Check submission dates, meeting dates, submission format (ie. hard copy)
  - Travel to IRB meetings for project approval, amendments, annual reports, closure, manuscripts, presentations
  - Plan for revisions and resubmission to both university and tribal IRBs

DG Part I: defining cancer

- *How would you define cancer?*
- *How did you learn about cancer?*
- *Do you think cancer is a problem for people of Navajo background? Do you think this has changed over the past years? If yes, why do you think this is?*

DG Part II: knowledge of causes, contributors to cancer and prevention and treatment

- *What do you think are the main causes of cancer?*
- *How did you find out about these causes?*
- *What do you think is the most important cause or contributor to cancer? If you were to rank all the factors you mentioned, what would be the most important and least important in your opinion?*
- *Are there any other contributors to cancer?*

Part II: knowledge of causes, contributors to cancer and prevention and treatment

- *Do you think cancer can be prevented? If so, how?*
- *Do you think lifestyle choices such as diet and physical activity impact getting cancer?*
- *Do you think cancer can be treated well?*
- *What do you think are important factors in cancer coming back after treatment?*
- *Do you think physical activity and other lifestyle factors impact cancer coming back?*


Restoring Balance


Restoring Balance
Restoring Balance

Rigor Category	NACP Pilot Study Phase II
Scientific Premise	-Cancer 1st or 2nd cause of death among Native Americans 45-64[1] -Disparities in survival rates[1,2] -Most common Navajo cancers positively affected by PA in other populations -No PA interventions among Navajo cancer survivors to date -Feasibility study needed to formulate rigorous full study
Scientific Rigor (design)	-Randomized controlled trial w/ repeated measures -National cancer exercise guidelines, adapted for cultural factors based on rigorous qualitative study -standardized, bilingual intervention delivery and data collection (feasibility, QOL, PA, biomarkers) -community capacity building to enhance sustainability, recruitment, retention -objective measure of PA, metabolic changes, body habitus -gold standard QOL survey (PROMIS)
Biological Variables	-Sex, age, wt, & underlying health conditions captured in survey and accounted for in analyses -limited to Navajo background -Tx & cancer stage by survey, no medical record review; limited power.
Authentication	-biomarkers measured B, 6, 12, 18wks; periodicity aligned with detection limits of PA related physiological changes -HbA1c valid and reliable marker of change in metabolic function; portability key so not venipuncture -anthropometric measures valid and reliable markers of change in body habitus; gold standard imaging not feasible

2010 ACSM & 2012 ACS

- Cancer-specific resistance training: Recommendations do not need to be modified for prostate, colon, and hematologic cancers
  - Breast: start with a supervised program of at least 16 sessions at a very low resistance; progress resistance at small increments
  - Prostate: add pelvic floor exercises for those who undergo radical prostatectomy
  - Colon: for patients with a stoma, start with low resistance and progress slowly to avoid herniation at the stoma
  - For bone marrow transplant patients, resistance training may be more beneficial than aerobic activity

Slide courtesy of Dr. David Garcia. Schmitz KH, et al. ACSM roundtable on exercise guidelines for cancer survivors. Med Sci Sports Exerc. 2010;42(7):1409-1426. Rock CL, et al. Nutrition and physical activity guidelines for cancer survivors. CA Cancer J Clin. 2012;62(4): 242-274.

Cancer-Specific Safety Precautions

- ACSM report identified safety cautions for survivors at risk for lymphedema and skeletal muscle fractures or infections
  - Arm and shoulder problems secondary to breast cancer treatment, ostomy after colon cancer, or swelling/ inflammation in the abdomen, groin, or lower extremity following gynecologic cancer
- Risks of participating in physical activity must be balanced against the risks of inactivity
  - PA reduces the incidence and severity of lymphedema

Slide courtesy of Dr. David Garcia. Schmitz KH, Courneya KS, Matthews C, et al. ACSM roundtable on exercise guidelines for cancer survivors. Med Sci Sports Exerc. 2010;42(7):1409-1426. Schmitz KH. Balancing lymphedema risk: exercise versus deconditioning for breast cancer survivors. Exerc Sport Sci Rev. 2010;38(1):17-24.

Intervention Mapping

PEN-3 and HBM	**Perceptions**	• Reinforce accurate beliefs about cancer causes, environmental and behavioral factors. • Reduce inaccurate beliefs about cancer. • Improve understanding of quantity and intensity of physical activity during and after cancer treatment.	• Provide education about cancer in Navajo and English. • Challenge fatalism and stoicism towards treatment and health post-diagnosis. • Promote ethnic pride and alignment of health and balance with cultural beliefs. • Skill building/health coaching to increase perceived control over health.	• Personalize the education depending on individuals' beliefs and level of knowledge.

Framework	Theor. Construct	Intervention Objectives	Strategies for weekly group sessions	Strategies for individual activities
PEN-3 and HBM	**Enablers (PEN-3)/ Perceived Barriers (HBM)**	• Decrease structural barriers to seeking treatment where possible (financial, logistic, cultural). • Decrease fear about screening and finding out test results. • Promote knowledge regarding the US healthcare system, what services are available and where to access services. • Reinforce trust of community health representatives. • Improve skills to promote communication with healthcare providers and family members about cancer.	• Discuss healthy changes that are possible within structural limitations. • Disseminate information about screening recommendations, where to seek treatment and services for translation and patient navigation. • Challenge negative beliefs about screening and learning about results. • Practice communication with medical providers (role-playing). • Practice goal setting and self-monitoring as effective techniques for improving diet and physical activity. • Highlight culminating event to facilitate behavioral strategies of (goal-setting/self-monitoring).	• Review individual structural barriers and ways to address them. • Engage in personalized goal-setting based on individuals' activity level. • Review home-based program activities based on activity monitors. • Practice communication with health provider one-on-one for issues participants are not comfortable discussing in group setting. • Reinforce progress towards individual goals and ability to self-monitor.

Intervention Mapping Cont.

PEN-3	**Nurturers** Supportive and/or discouraging influences of families and friends including eating tradition, community and events, spirituality and soul, values of friends.	• Reinforce the value of traditional foods and physical activity in cancer, prevention of other chronic disease and overall quality of life. • Reinforce cultural beliefs of restoring balance and aerobic physical activity. • Emphasize importance of and provide skills needed to seek social support. • Reinforce the importance of information about cancer for family members, including appropriate PA recommendations for survivors.	• Provide social support of fellow participants due to shared experiences and success/learned lessons; draw on prior successes. • Discuss cultural aspects of balance, health, physical activity and dietary habits. • Emphasize importance of gaining knowledge for dissemination to other family members (who are generally at elevated risk for cancer). • Provide real-life examples of coping strategies.	• Reinforce ability and importance of seeking and providing support. • Provide individualized education based on cultural and clinical knowledge of cancer. • Review success in employing coping strategies.

Intervention Mapping Cont.

HBM	**Perceived Susceptibility**	• Reinforce accurate beliefs about susceptibility. • Reduce fatalism about diagnosis.	• Provide and discuss culturally and clinically relevant educational materials about susceptibility, screening and physical activity recommendations for cancer survivors.	• Review knowledge of physical activity recommendations during and after treatment (back-teaching) • Review benefits of activity for each individual based on type of cancer.

Intervention Mapping Cont.

HBM	**Perceived Severity**	• Provide information that although cancer is a serious condition, survival rates of many cancers have improved, particularly with early diagnosis and adequate treatment.	• Develop list of pros/cons of engaging in regular screening, physical activity and healthy/traditional diet, and discuss reasons and consequences of engaging in healthy behaviors.	• Challenge inaccurate beliefs, reinforce accurate beliefs.

Intervention Mapping Cont.

HBM	**Perceived Benefits**	• Emphasize the role of physical activity for 13 different cancer types and in recurrence for several cancers. • Emphasize benefits of physical activity for fatigue and quality of life. • Emphasize the importance of early detection and following treatment and screening recommendations for patient and family members. • Improve knowledge of adequate intensity required to achieve protective benefits.	• Provide culturally appropriate education to survivors and family/community members on the importance of activity for cancer prevention and control, fatigue and quality of life. • Group discussion on benefits of early detection. • Group discussion on health behaviors currently engaged in/successful changes made in the past.	• Reinforce accurate individual beliefs, challenge inaccurate beliefs. • Review individual list of pros and cons and emphasize individual reason for engaging in healthy behaviors and personal control.

Intervention Mapping Cont.

HBM	**Self-Efficacy**	• Promote self-efficacy for secondary cancer prevention. • Promote self-efficacy to engage in behavioral strategies of physical activity and other health behaviors. • Promote sense of self-control to improve quality of life and cancer fatigue. • Promote ability to seek and utilize resources.	• Provide information on baseline activity status and progress towards goals. • Empower participants to take control of their own health. • Group discussion on successes achieved to overcome health challenges (e.g. treatment side effects) during and post-treatment. • Emphasize opportunity for participants to improve experiences of other family/community members. • Share successes at the group level.	• Positive reinforcement of healthy behaviors; draw upon strengths and successes. • Reduce anxiety or discomfort associated with changes.

Timeline Phase II