ADDRESSING BARRIERS TO MEDICATION ADHERENCE: AN EVIDENCE-BASED SCREENING INSTRUMENT VALIDATION STUDY

Project Complete October 2018

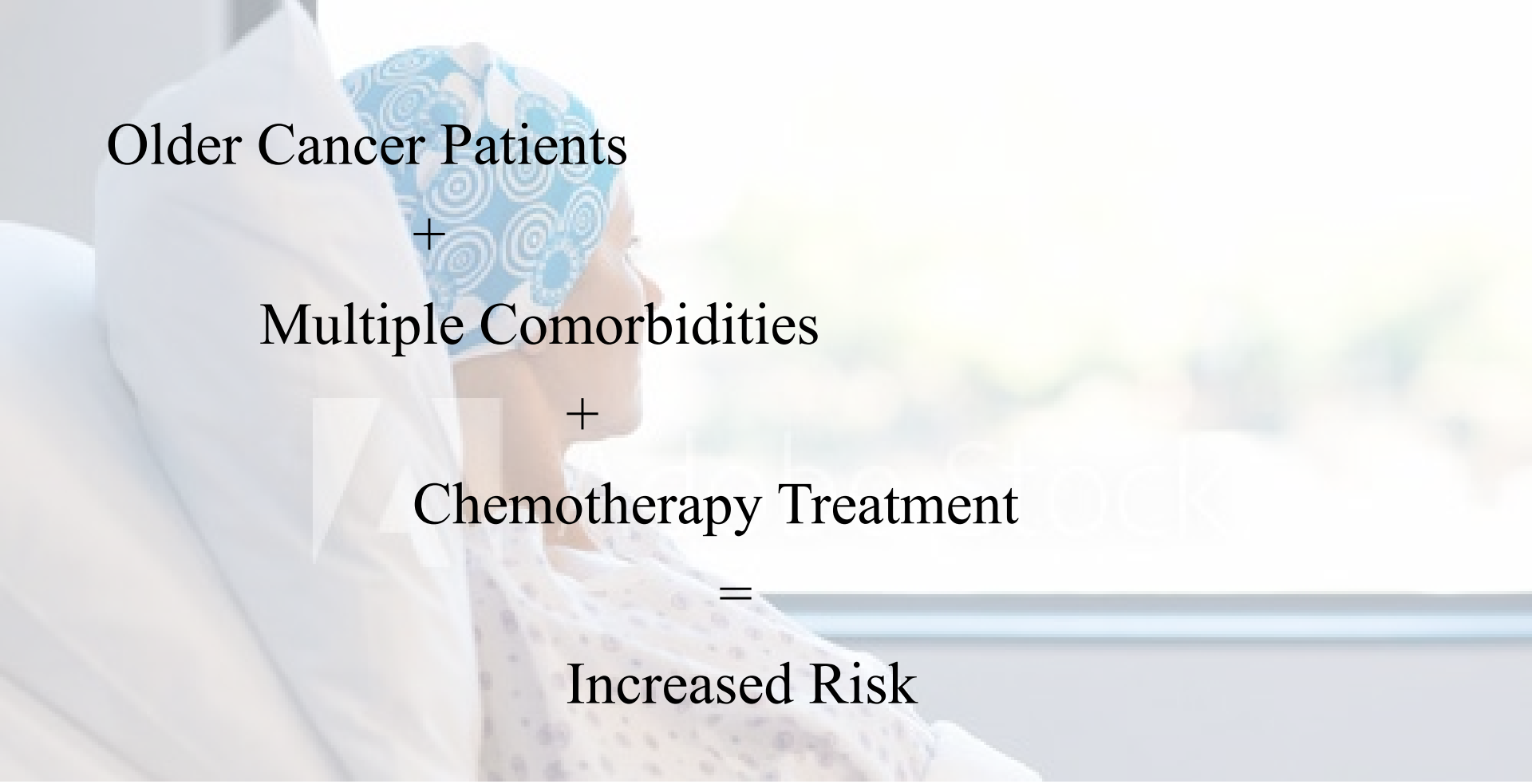
Donna Washburn DNP, RN, CNS, ACNS-BC, AOCNS

Disclosure

- **Authors:**
  - D. Washburn DNP, RN, CNS, ACNS-BC, AOCNS
    - Director of Professional Clinical Practice at Centra Health
    - Faculty Adjunct for MSN for Liberty University
      - Health Policy and Ethics; Nursing Theory and Advanced Practice
  - Ken Thompson PharmD
    - Professor DNP Faculty for Liberty University
    - Chair for this doctoral project
- **Objectives:**
  - Recognize rationale for use of an instrument to identify medication adherence barriers
  - Explain early development of an evidence-based instrument
  - Describe a pilot test used to evaluate the instrument
- **No Conflict of Interest**

Introduction

- Adherence is critical to management of comorbid disease
  - Mental illness
  - DM-2
  - HTN/CVD
  - Renal Impairment
  - COPD



Older Cancer Patients

+

Multiple Comorbidities

+

Chemotherapy Treatment

=

Increased Risk

(Sarfati, Koczwara, & Jackson, 2016).

- **Adherence**:

  “The extent to which a persons’
  behavior corresponds with agreed recommendations from a healthcare provider“ (WHO)

- **Barriers are real:**
  - Financial
  - Psychological
  - Educational
  - Medical, and
  - Behavioral

- **Barriers are complicated**:
  - Intentional
  - Unintentional
  - Independent
  - Intertwined

Healthcare providers need to know:

50% to 60%
of patients
nonadherent
to
prescribed treatment
regimen

(Lam & Fresco, 2015).

Background

- 42 significant barriers identified in one extensive meta-analysis of research (Irwin & Johnson, 2015).

- Research to address barriers often focuses on a single barrier such as education or finance.

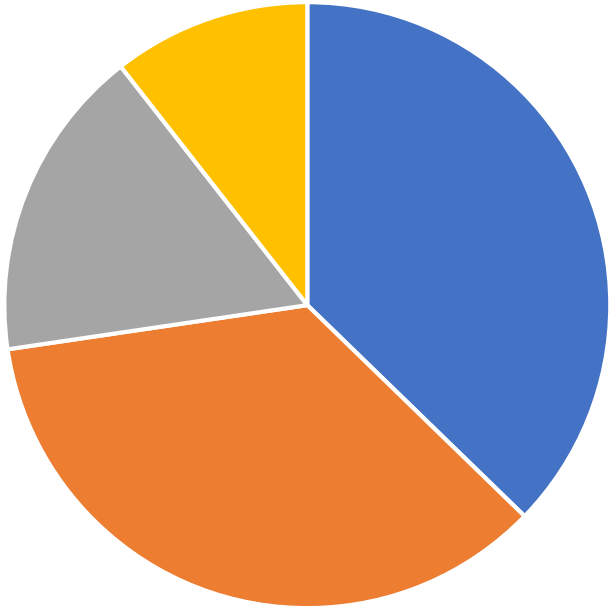
Prescriptions

•make it to the pharmacy
50% to 70%

•come out of pharmacy
48% to 66%

•taken properly
25% to 30%

•refilled as prescribed
15% to 20%



(AMA, 2018; CDC, 2017; Millionhearts.hhs.gov, 2017)

Problem Statement

Non-adherence leads to uncontrolled comorbid illness and potential for reduced cancer treatment efficacy

Healthcare providers need a valid, efficient evidence-based process to screen for the most impactful barriers

Objective

- develop an evidence-based observational screening instrument

- evaluate its potential for identifying barriers to medication adherence in adult oncology patients.

Method

- Search Literature
- Categorize into five barriers
- Organize into a screening instrument
- Study: A retrospective, quasi-experimental, observational comparison study was used to evaluate retrospective data of patients with co-morbidities.

Search Strategy

- Databases:
  - CINAHL Plus with Full Text, Cochrane Library, JAMA, Journals@Ovid, MEDLINE, MEDLINE with Full-Text (EBSCO), Nursing and Allied Health, and ProQuest
- Keywords and Phrases:
  - *readmission, rehospitalizations, cancer, oncology, diabetes type 2, depression, behavior, comorbidities, medication(s), adherence, nonadherence, compliance, noncompliance, barriers, obstacles, challenges, difficulties, issues, stigma, predictors, predicting, causes, drug therapy, polypharmacy, prescriptions, providers, outcomes, quality of life, algorithm, toolkit, questionnaire, assessment, instrument*

- Sources reviewed:
  - 990
- Sources used in project manuscript:
  - 55 (29 research articles and 26 additional sources)

- Melnyk Levels of Evidence used to analyze literature.
  - Priority given to level one systematic reviews, meta-analysis, meta-analysis with triangulation, clinical guidelines based on systematic reviews and meta-analysis

Critical Appraisal

Financial Social	• (AMA, 2018); (Wooldridge, Schnipper, Goggins, Dittus, & Kripalani, 2016); (Hanson, Habibi, Khamo, Abdou & Stubbings, 2014); (NCPA, 2013); (Heath, 2017); (Frakt, 2017); (KFF, 2017); (Kangovi et al., 2012); (Irwin & Johnson, 2015); (Greer et al., 2016).
Depression Distress Anxiety	• (AMA, 2018); (American Family Physician, 2012); (Millionhearts.hhs.gov, 2017); (Greer et al., 2016); (Mausbach, Schwab & Irwin, 2015); (Aikens, Trivedi, Aron, & Piette, 2015); (Spoelstra, & Sansoucie, 2015).
Medical Related Concerns	• (AMA, 2018); (CDC, 2017); (Irwin, & Johnson, 2015); (NCPA, 2013); (Peeters et al., 2015); (Balling, Erstad, & Weibel, 2015); (Lam & Fresco, 2015); (Wooldridge, Schnipper, Goggins, Dittus, & Kripalani, 2016).
Behaviors and Lifestyle	• (NCPA, 2013); (Frakt, 2017); (Millionhearts.hhs.gov, 2017); (Irwin, & Johnson, 2015); (ONS, 2016); (Wooldridge, Schnipper, Goggins, Dittus, & Kripalani, 2016).
Educational Barriers	• (Millionhearts.hhs.gov, 2017); (AMA, 2018); (Spoelstra, & Sansoucie, 2015); (Irwin, & Johnson, 2015); (Cawthon, Mion, Willens, Roumie & Kripalani, 2014); (CDC, 2017); (Heath, 2017); (Parr, 2017); (Boucher, Lucca, Hooper, Pedulla, & Berry, 2015); (Al-Batran, 2015); (Patel, Phuoc, Bachler & Atkinson, 2017); (Tomko et al., 2013); (Kangovi et al., 2012).

1. Financial and Social Barriers

- Cost is reason for not filling prescription 23.5% of the time in project by Wooldridge, Schnipper, Goggins, Dittus, & Kripalani (2016).
- 35% of patients taking four or more pills a day reported taking lower dosage or skipped doses (KFF, 2017).
- Social Support a factor 32% of the time in a meta-analysis with triangulation (Irwin & Johnson, 2015).

. Depression/Distress/Anxiety

- In a meta-analysis by Mausbach, Schwab, & Irwin (2015) 17,000 women evaluated for association of depression and adherence to oral anticancer therapy.
  - greater depression = lower adherence.
  - increased mortality
  - worse quality of life
- Depression, anxiety are predictors of poor adherence. (Millionhearts.hhs.gov, 2017).
- Long-term distress may be a predictor of non-adherence (Aikens, Trivedi, Aron, & Piette, 2015).

3. Medical

- Roop & Wu (2014) - One of the most frequently identified barriers was adverse effects of medication.

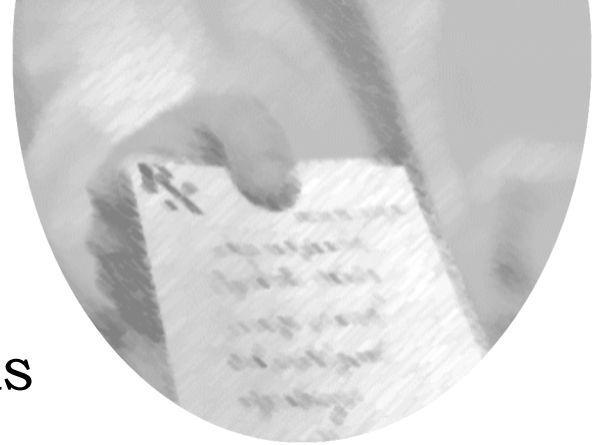
- Greater number of different medications prescribed and higher daily frequency, increases nonadherence (AMA, 2018).

- A meta-analysis of qualitative research with triangulation to quantitative research revealed a 42% frequency of provider relationship as a predictor of adherence (Irwin, & Johnson, 2015).

4. Behavior and Lifestyle

- Forgetting was #1 self-reported reason for nonadherence in a national telephone survey (NCPA, 2013).
  - additional research revealed may not be as large an impact (Frakt, 2017).
- Impact of "doubting necessity" 35% in a meta-analysis of research with triangulation (Irwin, & Johnson, 2015).
- More than 10 medications significantly associated with not filling medications. (Millionhearts.hhs.gov, 2017).

5. Educational



- Medication knowledge was mentioned 25% of the time as a barrier to adherence in an extensive meta-analysis of qualitative studies triangulated with quantitative studies (Irwin, & Johnson, 2015).
- 90 million adults in the United States have low health literacy which is associated with lower rates of preventive care, poorer disease control, and greater mortality, as well as increased health care utilization and costs (Cawthon, Mion, Willens, Roumie & Kripalani, 2014).

Theoretical Framework:

Theory of Transitions
Dr. Afaf Ibrahim Meleis

- Transitions occur when people go through various stages and situations in life (Im, 2013).
  - Developmental
  - Situational
  - Health/illness
  - Organizational

Summary

- Comprehensive screening instrument addressing all five categories was not found
- With the Iowa model as a guide, it was decided to develop an evidence-based screening instrument.
  - literature classified into five categories of adherence barriers with accompanying evidence-based warning signs.
  - Result? A one-page, comprehensive screening instrument.
  - Instrument has been titled, “W-BMA” (Washburn_Barriers to Medication Adherence risk assessment).

- Alan B. Pearson Comprehensive Cancer Center, Medical Oncology Clinic
- IRB Approval
- Support from key stakeholders
- CMS Oncology Care Model

Design of Study

- The Iowa model guides the researcher to test a change in practice with a pilot study (Iowa Model Collaborative, 2017).
- Retrospective, quasi-experimental, observational comparison study.
- Patient data was reviewed for existing screening methods of financial counseling, depression, distress.
- Then the new screening instrument was used to identify barriers, interventions, uncontrolled illness, and other details.
  - NCCN CTCAE criteria used for grading uncontrolled illnesses.
- Data was evaluated using frequency tables and classification tree which also helped analyze instrument sensitivity.

Population

- Patients enrolled in the OCM program.
  - Medicare recipients.
  - Received chemotherapy treatment
- At least two visits within the previous year
- Sample of 250/759 patients was selected via a report identifying those who met criteria
- Every third person selected to ensure systematic sampling
- OCM patients are managed more closely than typical patients and are more likely to have had all recommended care (reducing potential confounding variables)

Population

- Sample:
  - 250 retrospective samples,
  - seen at least twice in previous year,
  - majority of sample born between 1934 and 1950,
  - 119 male and 131 females,
  - Average number of prescribed medications = 10,
    - With 10% taking over 20 medications each.

Average Subject Profile

- 74-year-old female
- English-speaking
- Social Security with Medicare
- Cancer diagnoses
- Chemotherapy treatments
- DM-2 (elevated blood glucose)
- HTN (stage 2 hypertension)
- Ten medications
- Her medication list that she provides to the oncologist, does not match what she provides to healthcare personnel as an inpatient.
- She lives with her spouse
- ECOG 1

Data Collection

- Data reviewed and recorded financial concerns/counseling, the presence of PHQ-9 depression screen score of 15 or higher and an NCCN Distress score of 4 or higher and any relevant interventions.

- Following that initial comparison assessment, the record was then analyzed with the W-BMA screening instrument and interventions.
  - The W-BMA screening instrument includes the depression and distress screening results as part of the comprehensive review of risk.

- Also noted and recorded were signs and symptoms of uncontrolled illness, symptoms, relationship to medication, and unplanned healthcare visits.

- Data was collected and evaluated with SPSS to measure outcomes:
  - First, to see if there was an increase in percentage of patients identified with actionable barriers to medication adherence compared to those identified in current screening methods alone.
  - Second, to see if there is instrument sensitivity as predicted by analyzing if patients identified also had uncontrolled illness/adverse events.

W-BMA Instrument

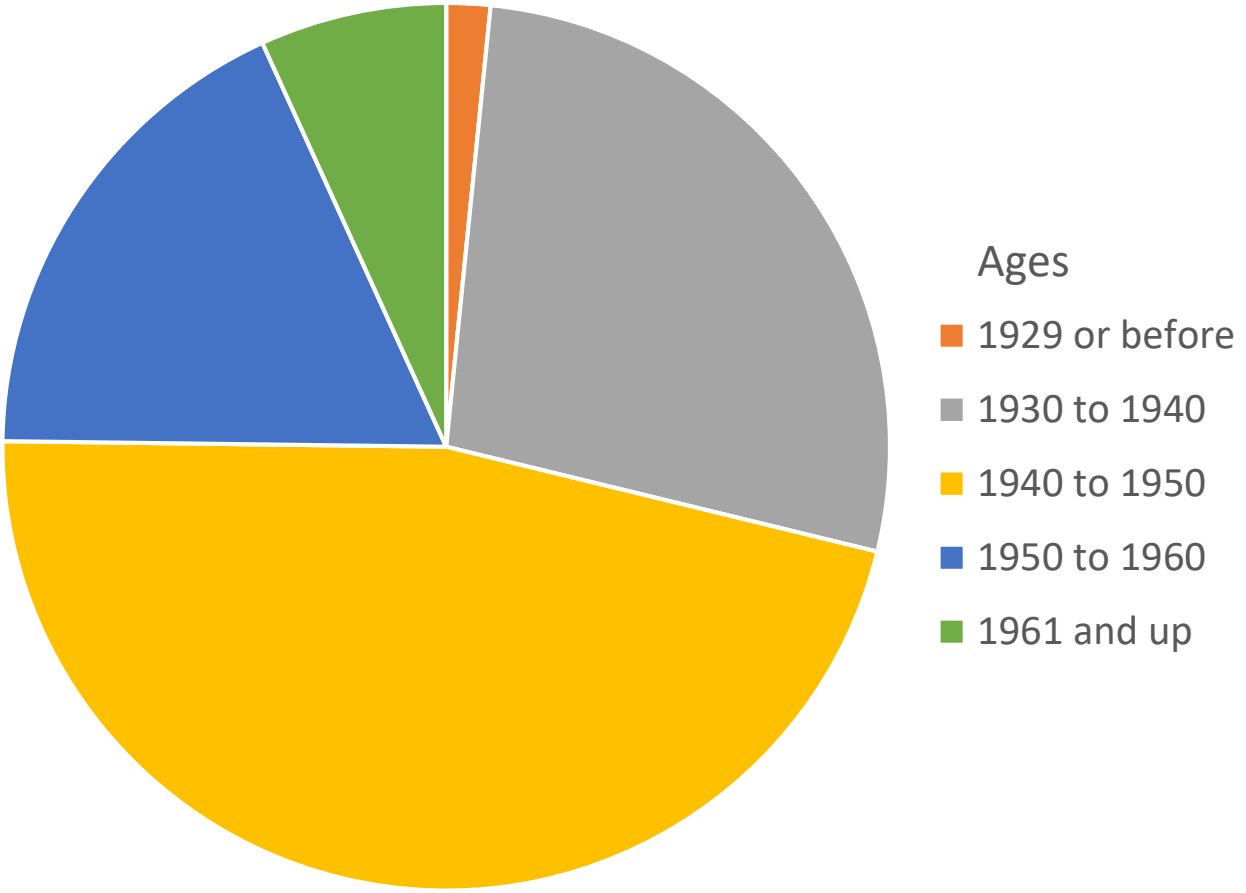
Medication Adherence Barrier Identification Tool

Place a check next to each potential barrier identified (If implemented, tool will include instructions to refer to an oncology navigator if any warning signs identified for coordination of interdisciplinary care)

Barrier:	**Warning Signs:**	**Notes: (referrals/interventions)**
☐ **Financial/Social Support**	○ Age 65 or higher and one or more of the following: ○ Unmarried and/or absence of social support ○ Medicaid eligible ○ Income less than 50,000 dollars/year ○ Limited pharmacy access (location of residence related to pharmacy, resides outside of city, lack of transportation)	
☐ **Depression/Distress/ Anxiety**	○ PHQ-9 Depression screen Score of 15 or higher ○ NCCN Distress Score of 4 or higher ○ Diganoses of anxiety, or on medication for anxiety	
☐ **Medical Related Concerns** *Related cues: Side effects/Effectiveness/Medication Reconciliation Issues/relationship with provider/multiple comorbidities/ Polypharmacy/ Poor Performance Score (ECOG)/cancer therapy last 6 months*	○ More than 10 medications ○ Uncontolled illness ○ Unexpected side effects and/or lack of expected side effects ○ Distressed about side effects ○ Prescription not filled or refilled at expected rate ○ Late stage of cancer ○ Poor physical status (ECOG 1 or over) ○ Provider relationship strained ○ No show for appointments and reluctance to reschedule/Requesting a different provider ○ Significant other concerns about not following treatment regimen	Record # of meds here:_____
☐ **Behavior/Lifestyle** *Related cues: Forgetting/Don't think it's needed/Didn't "agree" to take it/Don't like taking it/ too busy/Away from home/no established routine*	○ Prescription not refilled at expected intervals ○ Pill bottle contains more pills than it should based on fill date (If it is the original bottle) ○ Taking additional unprescribed herbal or "natural" substances ○ Tobacco, ETOH abuse, illegal drug use ○ Weekly/daily pill box contains unopened/unused pills ○ Reluctance to accept a change in regimen ○ Preference to be "prescription free" or "all natural" or other alternatives	
☐ **Educational** *Related cues: Knowledge deficits including general knowledge/limited English proficiency/functional/Cognitive/ Psychological/Health literacy/Vision Impairment/Hard of Hearing/Memory impairment/misconceptions /Distrust*	○ English is not first language ○ Reluctance, difficulty, or inability to read and/or correctly explain written medication instructions (on pill bottle or med list) ○ Medication not taken correctly ○ Identifies medications by color, size, and shape but unable to explain what medications are, or what they are for. ○ Has not filled prescription/reluctant to answer questions about compliance with regimen ○ Significant other takes care of all paperwork ○ Known memory impairment	

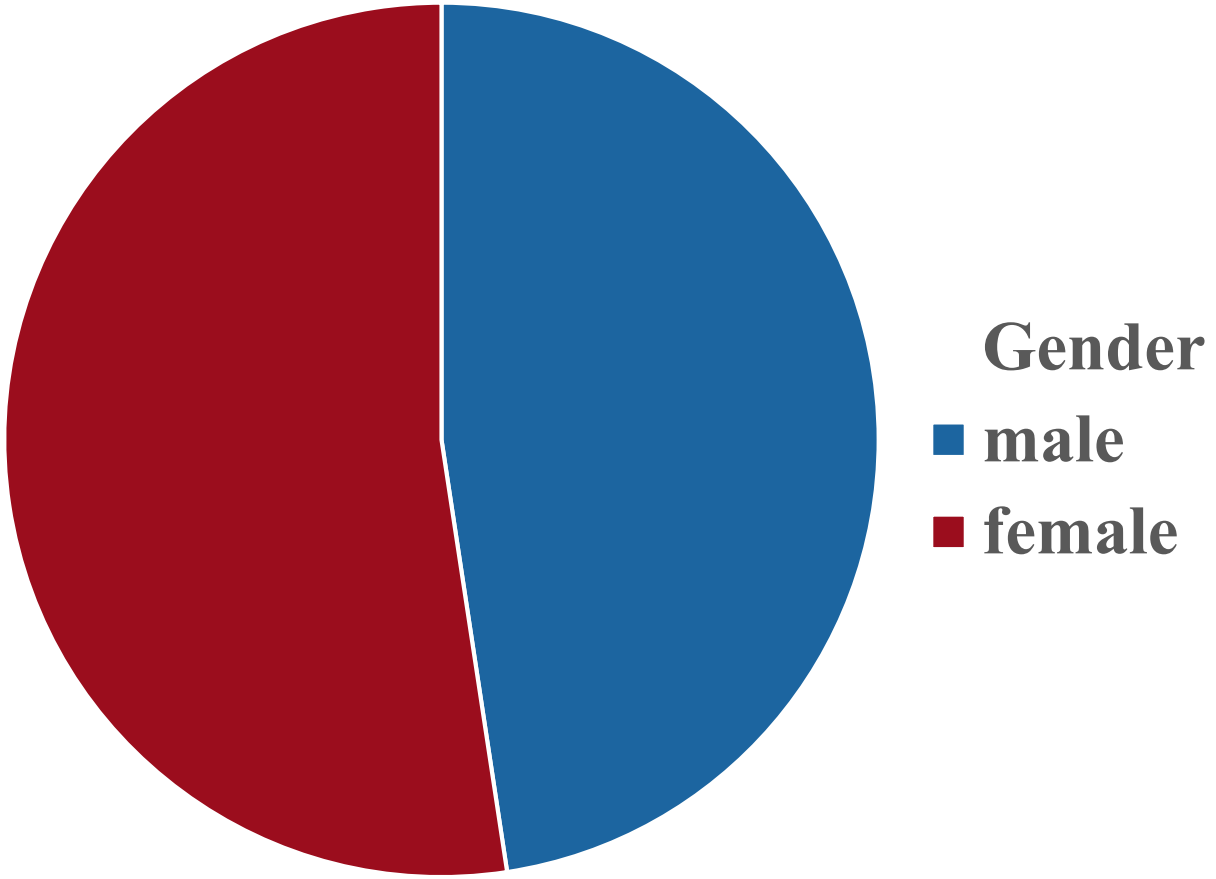
Results

Chart 1:
Age Groups of Subjects



Results

Chart 2:
Gender of Subjects



SPSS Frequencies Statistics:

PosCurrentPorNonly

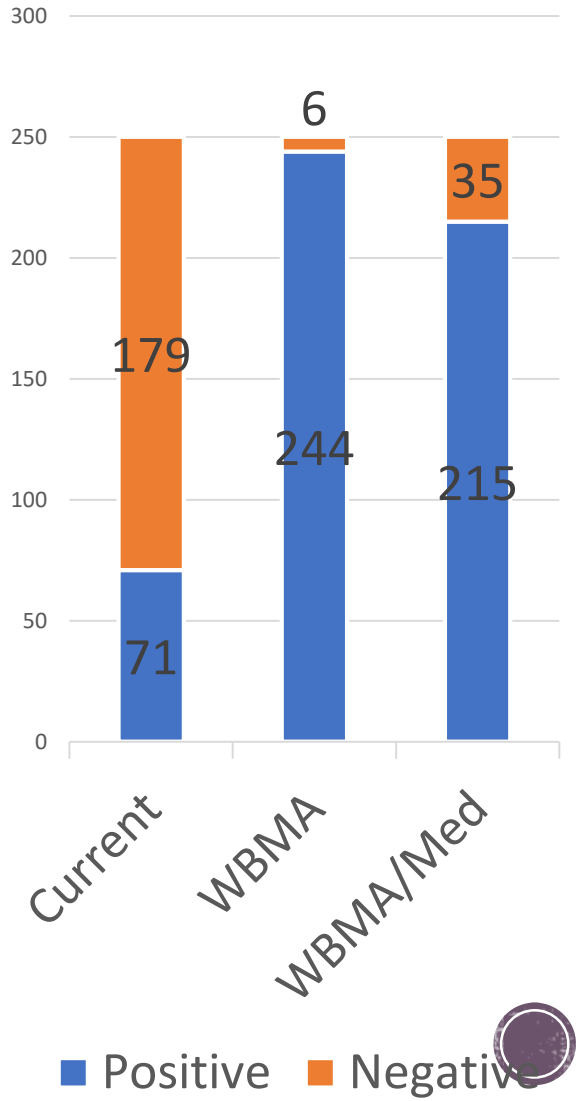
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	71	28.4	28.4	28.4
	no	179	71.6	71.6	100.0
	Total	250	100.0	100.0	

PosWBMA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	244	97.6	97.6	97.6
	no	6	2.4	2.4	100.0
	Total	250	100.0	100.0	

PosWBMAunaddressed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	215	86.0	86.0	86.0
	no	35	14.0	14.0	100.0
	Total	250	100.0	100.0	



Results

- Null hypothesis rejected.
  - The current screening method does not identify the same number of patients at risk as the W-BMA.
- In addition, significant numbers of patients with barriers and uncontrolled illness went undetected using the existing screens.
- The Classification Tree further defines the data.

W-BMA Classification Tree Results

- To further evaluate the impact of barriers found by the W-BMA instrument:
  - 56.6% of the time, uncontrolled illness was found in patients prescribed a medication for that disease
  - 62.0% ($P < .0002$) had undetected medical related barriers.

W-BMA Classification Tree Results

- From the same group of patients with uncontrolled illness related to medication prescriptions 29% ($P < .0002$) of those individuals had uncontrolled illness possibly related to undetected behavior and lifestyle related barriers. In that case, 80% went undetected.

- As in the first tree, we see 34% lower incidence of uncontrolled illness when barriers are detected and addressed by oncology healthcare personnel.

Results

- SPSS sensitivity test on patients with barriers:
  - 83.2% of patients identified with barriers had an uncontrolled illness. (Chart not shown)
  - 86.2% of patients with barriers had uncontrolled illness related to a prescribed medication.

Observed	.00	1.00	Percent Correct
.00	21	61	25.6%
1.00	5	102	95.3%
Overall Percentage	13.8%	86.2%	65.1%

Implications for practice:

- W-BMA was able to detect a larger group of patients at risk for nonadherence, than the current, existing method.
- Patients found by the W-BMA instrument with undetected barriers had a significantly high rate of uncontrolled illness and adverse events.
- Removing barriers to medication adherence may result in better controlled illness and reduced healthcare costs.

Discussion

Although the research did not focus on the impact of navigation or social work on patient adherence,

the data indicates that there is a strong relationship between lower rates of uncontrolled illness

and involvement of these support services to address barriers.

Conclusion

Healthcare systems must make the effort to improve adherence to medication regimens and reduce the incidence of uncontrolled illness and adverse events

The validating evidence from literature, and results of this pilot project, provide impetus to continue further exploration of use of the W-BMA screening instrument as part of a comprehensive adherence program in our most vulnerable patient populations

Questions

Thank you for allowing me to present my scholarly project today.

I’m happy to take any questions.

References

Aikens, J. E., Trivedi, R., Aron, D. C., & Piette, J. D. (2015). Integrating support persons into diabetes telemonitoring to improve self-management and medication adherence. Journal Of General Internal Medicine, 30(3), 319-326. doi:10.1007/s11606-014-3101-9

Al-Batran, M. (2015). Evidence based practice: The effectiveness of group psychoeducation for medications adherence among inpatient adults with schizophrenia in psychiatric and mental health settings.. Middle East Journal Of Nursing, 9(2), 25-30.

American Medical Association (AMA). (2018). Stepsforward. [Online education module and toolkit]. Retrieved from: https://www.stepsforward.org/modules/medication-adherence

American Association of Colleges of Nurses (2006). The essentials of doctoral education for advanced nursing practice. Retrieved from http://www.aacnnursing.org/DNP/DNP-Essentials.

American Society of Clinical Oncology (ASCO). (2016). Retrieved November 01, 2016, from http://www.instituteforquality.org/quality-oncology-practice-initiative-qopi

References

Aarts, M. J., Alerts, J. G., van den Borne, B. E., Biesma, B., Lemmens, V. E. P. P., & Kloover, J. S. (2015). Comorbidity in Patients With Small-Cell Lung Cancer: Trends and Prognostic Impact. Clinical Lung Cancer, 16(4), 282-291. doi:10.1016/j.cllc.2014.12.003

Balling, L., Erstad, B. L., & Weibel, K. (2015). Impact of a transition-of-care pharmacist during hospital discharge. Journal Of The American Pharmacists Association: Japha, 55(4), 443-448. doi:10.1331/JAPhA.2015.14087

Barthélémy, P., Asmane-De la Porte, I., Meyer, N., Duclos, B., Serra, S., Dourthe, L.-M., . Kurtz, J.-E. (2014). Adherence and Patients' Attitudes to Oral Anticancer Drugs: A Prospective Series of 201 Patients Focusing on Targeted Therapies. Oncology, 88(1), 1. doi:10.1159/000366226

Bender, C. M., Gentry, A. L., Brufsky, A. M., Casillo, F. E., Cohen, S. M., Dailey, M. M., . . . Sereika, S. M. (2014). Influence of patient and treatment factors on adherence to adjuvant endocrine therapy in breast cancer. Oncology Nursing Forum, 41(3), 274. doi:10.1188/14.ONF.274-285

References

Boucher, J., Lucca, J., Hooper, C., Pedulla, L., & Berry, D. L. (2015). A Structured Nursing Intervention to Address Oral Chemotherapy Adherence in Patients With Non-Small Cell Lung Cancer. Oncology Nursing Forum. 42(4), 383.

Brewer, S., Whitten, S., & Dziodzio, J. (2016). Implementation of a COPD clinical pathway with a dedicated respiratory therapist team. TEAM. Respiratory Care, 61(10), OF53.

Cawthon, C., Mion, L., Willens, D., Roumie, C., & Kripalani, S. (2014). Implementing routine health literacy assessment in hospital and primary care patients. The Joint Commission Journal on Quality and Patient Safety:Joint Commission Resources. 40(2): 68-76.

Centers for Disease Control and Prevention (CDC). (2017, February). Overcoming barriers to medication adherence for chronic diseases. Retrieved from: https://www.cdc.gov/cdcgrandrounds/archives/2017/February2017.htm

Centers for Disease Control and Prevention (CDC). (2017, May). Faststats:Health expenditures. Retrieved from: https://www.cdc.gov/nchs/fastats/health-expenditures.htm

References

Centers for Medicare and Medicaid Services (CMS). (2017a). National health expenditure data: projected. Retrieved from: https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nationalhealthaccountsprojected.html

Centers for Medicare and Medicaid Services (CMS). (2017b). CMS Special Innovation Project Maintenance and Development of Medication Measures Contract Number: HHSM-500-2011-FL10C; SIP-FL-01 [Adherence to diabetes agents measure information form]. Retrieved from: file:///C:/Users/Washburn/AppData/Local/Temp/Temp1_NQF-2468.zip/2013_NQF%202468_Measure%20Information%20Form.pdf

Centers for Medicare and Medicaid Services (CMS). (2018). Hospital outpatient quality reporting program. Retrieved from: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/HospitalOutpatientQualityReportingProgram.html

References

Cullen, L., & Adams, S. L. (2012). Planning for implementation of evidence-based practice. Journal of Nursing Administration, 42(4), 222-230. doi:10.1097/NNA.0b013e31824ccd0a

Duncan, P. W., Bushnell, C. D., Rosamond, W. D., Berkeley, S. J., Gesell, S. B., D'Agostino Jr, R. B., & ... Sissine, M. E. (2017). The Comprehensive Post-Acute Stroke Services (COMPASS) study: design and methods for a cluster-randomized pragmatic trial. BMC Neurology, 171-13. doi:10.1186/s12883-017-0907-1

Flink, M., & Ekstedt, M. (2016). Prerequisites for patient self-management learning at hospital discharge - an observational multiple case study. International Journal Of Integrated Care (IJIC), 16(6), 1-2. doi:10.5334/ijic.2768

Frakt, A. (2017). People don't take their pills: Only one thing seems to help. The New York Times: The Upshot [online journal]. Retrieved from: https://www.nytimes.com/2017/12/11/upshot/people-dont-take-their-pills-only-one-thing-seems-to-help.html

References

Greer, J. A., Amoyal, N., Nisotel, L., Fishbein, J. N., Macdonald, J., Stagl, J., . . . Pirl, W. F. (2016). A Systematic Review of Adherence to Oral Antineoplastic Therapies. Oncologist, 21(3), 354-376. doi:10.1634/theoncologist.2015-0405

Hall, H. R., & Roussel, L. (2014). Evidence-based practice: an integrative approach to research, administration, and practice. Burlington, MA: Jones & Bartlett Learning.

Hanson, R. L., Habibi, M., Khamo, N., Abdou, S., & Stubbings, J. (2014). Integrated clinical and specialty pharmacy practice model for management of patients with multiple sclerosis. American Journal Of Health-System Pharmacy, 71(6), 463-469. doi:10.2146/ajhp130495

Heath, S. (2017). What are the top common social determinants of health: Housing, public goods, geographic location, and education are some of the top common social determinants of health. Xtelligent Media: Patient EngagementHIT [Online Newsletter] Retrieved from: https://patientengagementhit.com/news/what-are-the-top-common-social-determinants-of-health

References

Hospital Compare (n.d.) Centers for Medicare & Medicaid Services, Baltimore, MD. Retrieved December 10, 2017 from https://www.medicare.gov/hospitalcompare/details.html?msrCd=prnt1grp1&ID=490021&stCd=VA&stName=Virginia

IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.

Im, E., (2013). Theory of Transitions. In Smith, MJ., & Liehr, P.R., (Eds.), Middle range theory for nursing (253-276). NewYork, US: Springer Publishing Company.

Institute of Medicine. (2013). Delivering high-quality cancer care: Charting a new course for a system in crisis. Washington, DC: The National Academies Press.

Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. Worldviews on Evidence-based Nursing, 14(3), 175-182. Doi: 10.1111/wvn.12223

Irwin, Margaret, PhD,R.N., M.N., & Johnson, Lee Ann,M.S.N., R.N. (2015). Factors influencing oral adherence: Qualitative metasummary and triangulation with quantitative evidence. Clinical Journal of Oncology Nursing, 19(3), 6-30. http://dx.doi.org.ezproxy.liberty.edu/10.1188/15.S1.CJON.6-30

References

Kaiser Family Foundation (KFF). (2017a). Public opinion on prescription drugs and their prices. [online slide presentation of a 2015-2017 tracking poll]. Retrieved from: https://www.kff.org/slideshow/public-opinion-on-prescription-drugs-and-their-prices/

Kaiser Family Foundation (KFF). (2017b). Kaiser health tracking poll - late april 2017. Methodology. Retrieved from: https://www.kff.org/report-section/kaiser-health-tracking-poll-late-april-2017-the-future-of-the-aca-and-health-care-the-budget-methodology/

Kangovi, S., Grande, D., Meehan, P., Mitra, N., Shannon, R., & Long, J. A. (2012). Perceptions of readmitted patients on the transition from hospital to home. Journal Of Hospital Medicine, 7(9), 709-712. doi:10.1002/jhm.1966

Lafeuille, M., Frois, C., Cloutier, M., Duh, M. S., Lefebvre, P., Pesa, J., & ... Durkin, M. (2016). Factors associated with adherence to the HEDIS quality measure in Medicaid patients with schizophrenia. American Health & Drug Benefits, 9(7), 399-409.

References

Lam, W., & Fresco, P. (2015). Medication adherence measures: an overview. BioMed Research International, 2015, 217047. http://doi.org/10.1166/2015/217047

Mateo, M. A., & Foreman, M. D. (2014). Research for advanced practice nurses: from evidence to practice (Vol. 2nd;2;). New York: Springer Pub.

Mathematics Learning Support Centre. (n.d.) Statistics: Paired t-tests. Retrieved from http://www.statstutor.ac.uk/resources/uploaded/paired-t-test.pdf

Maurer, D. (2012). Screening for depression. American Family Physician. Retrieved from: https://www.aafp.org/afp/2012/0115/p139.html

Mausbach, B. T., Schwab, R. B., & Irwin, S. A. (2015). Depression as a predictor of adherence to adjuvant endocrine therapy (AET) in women with breast cancer: a systematic review and meta-analysis. Breast Cancer Research and Treatment, 152(2), 239-246. doi:10.1007/s10549-015-3471-7

References

Meleis, A. (1975). Role insufficiency and role supplementation: A conceptual framework. Nursing Research. Retrieved December 15, 2016 from Researchgate.net. DOI: 10.1097/00006199-197507000-00004

Millionhearts.hhs.gov. (2017). Improving medication adherence among patients with hypertension: A tip sheet for health care professionals. Retrieved from: https://millionhearts.hhs.gov/files/TipSheet_HCP_MedAdherence.pdf

Moss, R. C., Lowe, G. C., Frampton, C. A., & Revell, P. (2014). A nurse-led randomised controlled trial of a structured educational programme for patients starting warfarin therapy. Journal of Research in Nursing, 19(5), 402-412. doi:10.1177/1744987113515261

Murphy, C. C., Bartholomew, L. K., Carpentier, M. Y., Bluethmann, S. M., & Vernon, S. W. (2012). Adherence to adjuvant hormonal therapy among breast cancer survivors in clinical practice: a systematic review. Breast Cancer Research and Treatment, 134(2), 459-478.

References

National Community Pharmacist's Association. (NCPA). (2013). Medication adherence in america: A national report card. Retrieved from: http://www.ncpa.co/adherence/AdherenceReportCard_Full.pdf

Oncology Care Model. (n.d.). Retrieved from: https://innovation.cms.gov/initiatives/oncology-care/

Oncology Nursing Society (ONS). (2016). Oral Adherence Toolkit. Retrieved from: https://www.ons.org/sites/default/files/ONS_Toolkit_ONLINE.pdf

Parr, K. (2017). Health literacy: Improving understanding of discharge instructions. Unpublished manuscript, School of Nursing, Liberty University, Lynchburg, Va.

Patel, S. D., Phuoc Anh (Anne), N., Bachler, M., & Atkinson, B. (2017). Implementation of postdischarge follow-up telephone calls at a comprehensive cancer center. American Journal Of Health-System Pharmacy, 74S42-S46. doi:10.2146/ajhp160805

References

Peeters, B., Van Tongelen, I., Duran, Z., Yüksel, G., Mehuys, E., Willems, S., & ... Boussery, K. (2015). Understanding medication adherence among patients of Turkish descent with type 2 diabetes: a qualitative study. Ethnicity & Health, 20(1), 87-105. doi:10.1080/13557858.2014.890174

Roop, J. C., & Wu, H.-S. (2014). Current practice patterns for oral chemotherapy: results of a national survey. Oncology Nursing Forum, 41(2), 185-A110. doi:10.1188/14.ONF.41-02AP

Sarfati, D., Koczwara, B., & Jackson, C. (2016). The impact of comorbidity on cancer and its treatment. CA: A Cancer Journal For Clinicians, 66(4), 337-350. doi:10.3322/caac.21342Spoelstra, S. L., & Sansoucie, H. (2015). Putting evidence into practice: Evidence-based interventions for oral agents for cancer. Clinical Journal of Oncology Nursing, 19(3), 60-72. doi:10.1188/15.S1.CJON.60-72

Sullivan. (2017). Essentials of Biostatistics in Public Health. Jones & Bartlett Learning.

Tomko, J. R., Ahmed, N., Mukherjee, K., Roma, R. S., Dilucente, D., & Orchowski, K. (2013). Evaluation of a discharge medication service on an acute psychiatric unit. Hospital Pharmacy, 48(4), 314-320. doi:10.1310/hpj4804-314.test

References

Vervloet, M., Spreeuwenberg, P., Bouvy, M. L., Heerdink, E. R., de Bakker, D. H., & van Dijk, L. (2013). Lazy sunday afternoons: the negative impact of interruptions in patients' daily routine on adherence to oral antidiabetic medication. A multilevel analysis of electronic monitoring data. European Journal Of Clinical Pharmacology, 69(8), 1599-1606. doi:10.1007/s00228-013-1511-y

Verbrugghe, M., Verhaeghe, S., Lauwaert, K., Beeckman, D., & Van Hecke, A. (2013). Determinants and associated factors influencing medication adherence and persistence to oral anticancer drugs: A systematic review. Cancer Treatment Reviews, 39(6), 610-621. doi:10.1016/j.ctrv.2012.12.014

Weiss, M., Brega, A., LeBlanc, W., Mabachi, N., Barnard, J., Albright, K., Cifuentes, M., Brach, C., West, D. (2016). Improving the effectiveness of medication review: Guidance from the health literacy universal precautions toolkit. *Journal of hte American Board of Family Medicine.* Retrieved from: http://www.jabfm.org/content/29/1/18

Wooldridge, K., Schnipper, J. L., Goggins, K., Dittus, R. S. and Kripalani, S. (2016), Refractory primary medication nonadherence: Prevalence and predictors after pharmacist counseling at hospital discharge. J. Hosp. Med., 11: 48–51. doi:10.1002/jhm.2446

World Health Organization (WHO). (2003). *Adherence to long-term therapies: Evidence for action.* Retrieved from http://www.who.int/chp/knowledge/publications/adherence_report/en/index.htm