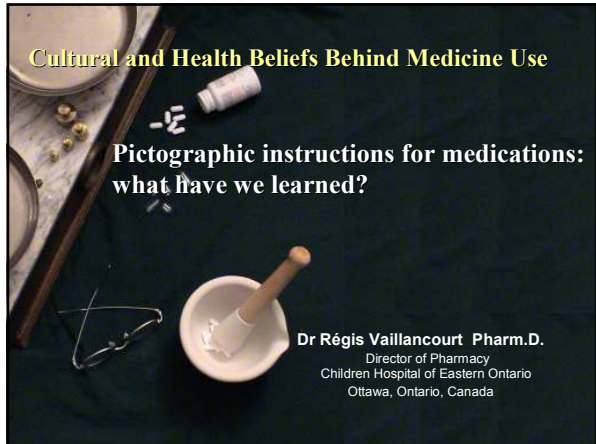


Cultural and Health Beliefs Behind Medicine Use


Pictographic instructions for medications: what have we learned?



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 Director of Pharmacy
 Children Hospital of Eastern Ontario
 Ottawa, Ontario, Canada

"A Picture Is Worth Ten Thousand Words."

- The quotation is actually phony. The "Chinese" quotation was fabricated by an advertising executive representing a baking soda company. The executive assumed that consumers would be compelled to buy a product that had the weight of Chinese philosophy behind it.





Presentation Outline

- Health literacy
- Pictograms background
- Culture specific Pictograms
- Pictograms projects

Canadian Health-Literacy Scores

Average health-literacy scores, population aged 16 and over (including seniors), Canada, provinces and territories

LEVEL	SCORE RANGE
1	0-225
2	226-275
3	276-325
4	326-375
5	376-500


1	Poor skills
2	Only simple, clear material involving uncomplicated tasks
3	Adequate to cope with demands of everyday life
4-5	Strong skills

Statistics Canada, Adult Literacy and Life Skills Survey (2003)

Canadian Literacy Proficiency by Age

Distribution of prose proficiency levels, by age group, Canada excluding territories, population aged 16 to 65, 2003

Stats Can. (2008) Learning Literacy in Canada: Evidence from the International Survey of Reading Skills.



Predictors of asthma control in children from different ethnic origins living in Amsterdam.


- **N= 278**
- conclusion, ethnicity as well as insufficient comprehension of the Dutch language appeared to be independent risk factors for uncontrolled asthma.

Respir Med. 2007 Apr;101(4):779-85



Health Literacy and Diabetes

Treatment	Requirement
<ul style="list-style-type: none"> • Glycemic control • Healthy diet • Physical activity • Medication 	<ul style="list-style-type: none"> • Interpret <ul style="list-style-type: none"> • Blood sugar • Nutritional labeling • Planned exercise program • Dosage adjustment



Characteristics of 1002 Adults with Diabetes by Literacy Level Values

Characteristics	Inadequate Literacy	Marginal Literacy	Adequate Literacy	P Value
Number of subjects	105	66	831	-
A1C, median (IQR)	6.9 (6.3-7.7)	6.8 (6.3-7.3)	6.9 (6.3-7.7)	0.50
Retinopathy	30%	34%	18%	<0.001
Cerebrovascular disease	21%	17%	10%	0.003
Coronary artery disease	30%	27%	17%	0.002

Literacy and health outcomes: a cross-sectional study in 1002 adults with diabetes. Morris, N, MacLean, C, Littenberg B. BMC Family Practice 2006, 7:49



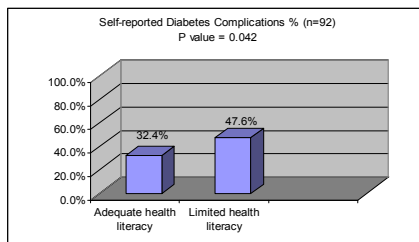
Spoken Knowledge in Low Literacy Patients with Diabetes Scale - SKILLD

- n=217 patients with type 2 diabetes and poor glycemic control
- Patients with SKILLD scores $\leq 50\%$ had significantly higher A1C (11.2% vs 10.3%, $p < 0.01$)

The Spoken Knowledge in Low Literacy in Diabetes Scale: a diabetes scale for vulnerable patients. Rothman RL, et al. Diabetes Educator 2005 Mar-Apr;31(2): 215-24.




Association of Health Literacy With Self-Management Behavior in Patients With Diabetes



Sarang, K. Quitsberg, A. Love, F. Shea, J. Diabetes Care, Volume 27, Number 12 December 2004.




Patient Education and Counseling
 Patient Education and Counseling 97 (2007) 293–300
www.elsevier.com/locate/ypmed

To err is human: Patient misinterpretations of prescription drug label instructions

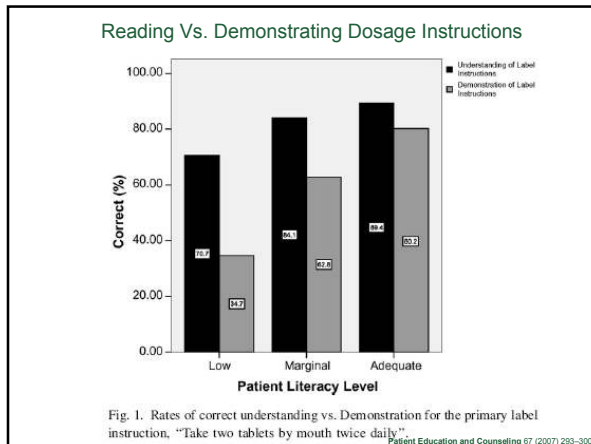
Michael S. Wolf^{a,c,d,e}, Terry C. Davis^a, William Shrank^a, David N. Rapp^{a,b,f},
 Pat F. Bass^a, Ella M. Conner^a, Maria Clayman^a, Ruth M. Purke^a


^aHealth Literacy and Learning Program, Institute for Healthcare Studies, Northwestern University, United States
^bDepartment of Preventive Medicine, Northwestern University, United States
^cDepartment of Health, Behavior and Society, Johns Hopkins University, United States
^dSchool of Education and Social Policy, Northwestern University, United States
^eDepartment of Community Development Research, United States
^fJulius Center for International Communication, Indiana University-Purdue University at Indianapolis, United States
 Received 17 February 2007; revised 16 March 2007; accepted 18 March 2007

Objective: To examine the nature and cause of patients' misunderstanding common dosage instructions on prescription drug container labels. **Methods:** In-person qualitative interviews including a literacy assessment were conducted among 100 patients in several diverse settings, one urban in Chicago, Los Angeles, and one Midwestern and Chicago. Patients were asked to read and demonstrate understanding of dosage instructions for five common prescription medications. Content understanding was determined by a panel of health literacy researchers using generic rubric response. Qualitative methods were employed to code interview responses and generate themes regarding causes for misunderstanding. **Results:** Rates of misunderstanding for the five drugs in general ranged from 3 to 20%. Patients in the Los Angeles and Chicago sites of misunderstanding ranged from 0 to 20% with majority of patients having 10% or less. In the Chicago site, 100% of patients were unable to read the instructions. The themes were identified as due either to common causes (misreading label language, complexity of instructions, unclear terms, typical dosage format, presence of abbreviations, label font size, and additional text on label instructions). **Conclusion:** Misunderstanding dosage instructions on prescription drug labels is common. While limited literacy is associated with misunderstanding the instructions, instructions are inherently complex, require oral interpretation, and are often written in small font. **Practice implications:** Prescription drug labels should use simple dosing instructions, clear and simple language, utilize a patient-friendly label format, health literacy, and cognitive function research should be conducted. © 2007 Published by Elsevier B.V.

Keywords: Prescription Drug Medication; Dosage; Medication; Therapy; Misunderstanding; Health Literacy

- **Objective:** To examine the cause of patients' misunderstanding of common dosage instructions on prescription drug container labels
- **Patient population:** adult patients from 5 low-income community populations in Illinois, USA (n = 395)





Cause: Label Language

- Errors were most prevalent for **"Take two tablets by mouth twice daily"**
 - The repetitiveness between dosage ("two") and frequency ("twice") leads to the interpretation "Take a pill twice a day".
 - 72% of patients responded incorrectly to "How many pills would you take in one day" (response of "two")
- Commonly used terms with poor recognition or pronunciation rates (for patients reading at the 6th-grade level and below):
 - Antibiotic (79%), orally (73%), teaspoonful (70%), medication (48%), prescription (45%), dose (35%).
- Patients recommended use of numeric symbols within the instruction rather than the written word equivalent (i.e. "2" versus "two")

Other Causes:

- **Complexity of instructions**
 - 11% of incorrect responses omitted duration of use from the specified instruction
 - Inclusion of duration on the label led to a loss of other aspects of the instruction
- **Implicit vs. explicit dosage intervals**
 - Better ability to interpret more explicit dose frequencies
 - "Take one tablet in the morning and one at 5 p.m." (90%), vs. "Take two tablets by mouth twice daily" (83%)
- **Label familiarity (auxiliary instructions)**
 - Very few patients were familiar with these instructions
 - <10% of patients physically turned any of the bottles to examine these stickers
- **Attentiveness to label instructions**
 - Patients with adequate literacy (44%) more likely than patients with low literacy (18%) to omit duration of use for the instruction
 - Mistaking "teaspoon" for "tablespoon" was more common among patients with limited literacy, but 1/2 of these errors were made by patients with adequate literacy



Patient-Provider Communication

Doctor-patient relationship has deteriorated

- Despite rapid advances in medical science
- Scientific knowledge is useless if there is a misunderstanding between patient and provider

Professionals are especially responsible for accurate communication

- Use training and competence for effective diagnosis and treatment


- 1) Fisher, N.L. (1992). Ethnocultural approaches to genetics. *Pediatric Clinics of North America*, 39, 55-64.
- 2) King GL, et al. (1983). *Ineffective communication: creative skills for the health profession*. Philadelphia: Saunders.
- 3) Lee ME, et al. (1992). Cultural influences on nonverbals in applied settings.
- 4) Todres ID. (1993). Communication between physician, patient, family in the pediatric intensive care unit. *Critical Care Medicine*, 21, 383-386.



Communication of Health Care Information

- Communication barriers between patient and the healthcare provider
 - Culture
 - Literacy / level of education
 - Disease
 - Language
 - Age

Health Literacy




cataracts

Diabetic Retinopathy

- The estimated crude prevalence rate for retinopathy and vision-threatening in adults 40 years and older known to have diabetes is 40.3% and 8.2% respectively

Diabetes, glaucoma, sex, and cataract: analysis of combined data from two case control studies. J J Harding, M Egerlon, R van Heyningen, and R S Harding. Br J Ophthalmol. 1993 January; 77(1): 2-6.

The Eye Diseases Prevalence Research Group: The prevalence of diabetic retinopathy among adults in the United States. Arch Ophthalmol 122:552-563, 2004



Health literacy

- The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions




Health Literacy Guidelines

to improve the quality and accessibility of health information for patients

- Set out your objective
- Use pictures/diagrams
 - Clarify text
 - Select realistic visuals
 - Use active captions
 - Explain how to use lists, charts or diaries
- Make it easy to read
 - Short words/short sentences
 - Avoid unfamiliar words
 - Give a clear action message
- Make it look easy to read
 - Lots of white space, no dense text
 - Large type; for older people
 - Sharp contrast
- Engage the reader
- Test your products
 - Write at 5th grade level or lower



International Alliance of Patients' Organizations
A global voice for patients




History of writing

- Oral language
- Cave paintings 25,000-30,000 years
- Token counting 9,000 years
- Pictures → pictograph → ideograph → sound






Pictograms= \$\$\$




Pictographs and Cartoons

“Visuals need not be elegant art. Often a simple line drawing or cartoon will do.”




Health Literacy: How Visuals Can Help Tell the Healthcare Story.
Osborne, H. Journal of Visual Communication in Medicine, March 2006; Vol 29, No 1, pp 28-32.



Pictogrammes

- ↑ Compréhension
- ↑ Rappel à court et à long terme (4 semaines)

1 Hogg P.E. et al. using pictographs to enhance recall of spoken medical instructions II. Patient education and Counselling, 2001;43:231-242.
2 Ngoh L.N. Shepherd M.D. Design, development and evaluation of visual aids for communicating prescription drug evaluations to illiterate patients in rural Cameroon. Patient education and Counselling 1997;24:245-261
3 Hogg P.E. et al. Using pictographs to enhance recall of spoken medical instructions. Patient education and Counselling, 1998;35:83-84.
4 Hogg P.e. et al. using pictographs to enhance recall of spoken medical instructions II. Patient education and Counselling, 2001;43:231-242.



Randomized Controlled Trial of a Pictogram-Based Intervention to Reduce Liquid Medication Dosing Errors and Improve Adherence Among Caregivers of Young Children

Arch Pediatr Adolesc Med. 2008;162(9):814-822

Objective:
evaluate the efficacy of a pictogram-based health literacy intervention to decrease liquid medication administration errors

Patient population: Parents and caregivers of children aged 30 days to 8 years who were prescribed liquid medications. Subjects were enrolled from the Bellevue Hospital Center, New York City.

Number of Participants: 245

Standard medication counseling Vs. Counseling using plain language, pictogram-based instruction sheets

What Was Assessed?

- Medication knowledge and related practices
- Dosing Accuracy
- Adherence

Medication knowledge and related practices

Medication knowledge and related practices	Pictogram-Based Intervention	Standard Medication Counseling
Dose frequency errors	0%	15.1%
Incorrect medication preparation* (daily dose medications)	10.9%	28.3%
Incorrect medication preparation* (as-needed dose medications)	21.5%	43.0%

* Related to shaking the medication before administration

Arch Pediatr Adolesc Med. 2008;162(9):814-820

Dosing Accuracy

- Caregiver accuracy was higher among intervention families

Dosing Accuracy	Pictogram-Based Intervention	Standard Medication Counseling
Inaccurate doses at the 20% cutoff point	5.4%	47.8%

Arch Pediatr Adolesc Med. 2008;162(9):814-821

Adherence

- Two categories of adherence used:
 - percentage of total prescribed doses given
 - date of last dose given

Adherence	Pictogram-Based Intervention	Standard Medication Counseling
Not given within 20% of total prescribed doses	9.3%	38.0%
Incorrect last day	27.9%	58.0%
>1 day before or after correct last day	4.7%	30.0%

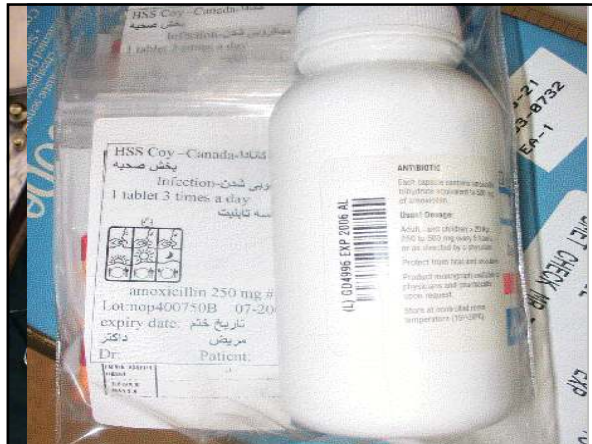
Nonadherence was lower in the intervention group for both categories of adherence as well as for each specific criterion

Arch Pediatr Adolesc Med. 2008;162(9):814-821

Medicine Labels Incorporating Pictograms: Do They Influence Understanding and Adherence?

- The presence of pictograms was found to contribute positively to both understanding of instructions and adherence.
 - Adherence
 - > 90% of the experimental group,
 - 72% of the control group.
 - Understanding
 - 70% control
 - 95%, intervention respectively, and average adherence was 72 and 90%, respectively.


Res Dowe, and Marina Ehlers
Faculty of Pharmacy, Rhodes University, Grahamstown 6140, South Africa





Pictogram Research

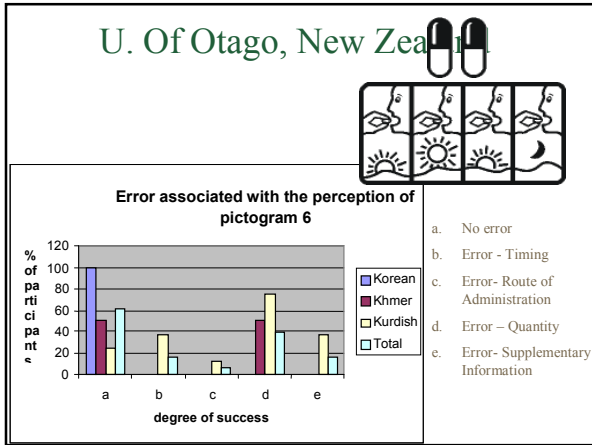
- University of Otago, New Zealand
- University of British Columbia, Canada
- International Federation of Pharmacy Students
 - Gabon (April 2005)
 - Benin (November 2005)
- Online survey
- Canada First Nation Mexico



Studies – University of Otago

- Pre-testing of pictograms used in medicines dispensed in missions of humanitarian relief
- Focus group based approach
 - Khmer
 - Kurdish
 - Korean
- Concluded that
 - After pictograms are pre-tested and developed they need field-testing
 - Pictograms should rarely be used as the sole communication source

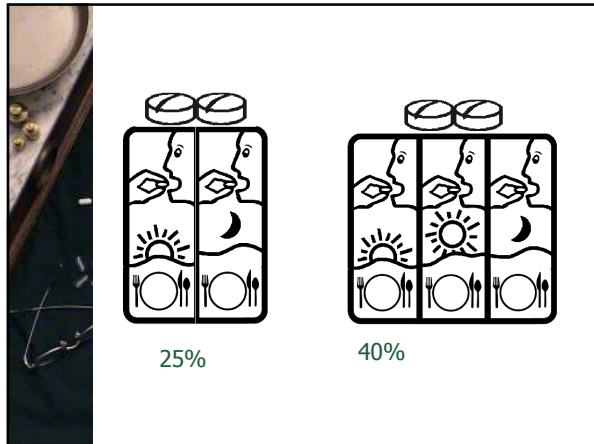


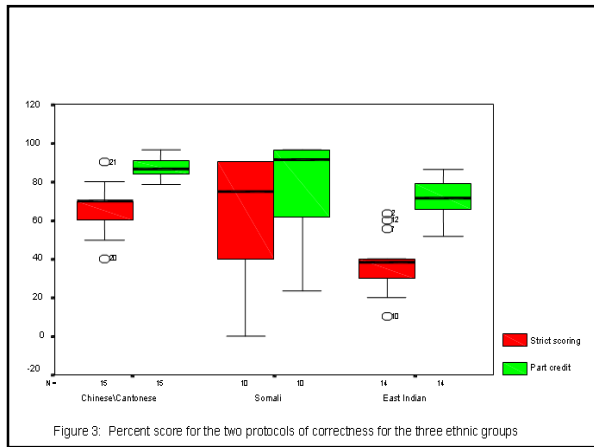


Studies - UBC

- Pictographic instructions for medications: do different cultures interpret them accurately?¹
 - Focus group approach to evaluate comprehension of 16 pictograms adapted from the USP DI pictogram set
 - Pendjabi
 - Somalian
 - Cantonese

Kassam, K., Vallancourt, R., Collins J.B. JPP, Volume 12(4) December 2004: 199-206(11)







Studies – International Pharmaceutical Federation

Board of International Pharmacy Practice (BPP) Special Project:

- Design, development, and evaluation of pictographic instructions to label medications
- New Orleans 2004
 - Framework established
 - Storyboard concept proposed
 - Initial pictograms developed
- Gabon, Benin

The Storyboard Concept

- Size matters: half page
- WHO /FIP guidelines pictograms should only be used to supplement written or verbal counseling

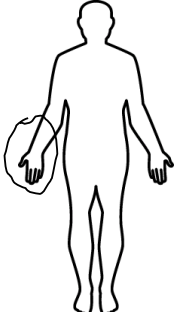


FIP Studies - Gabon

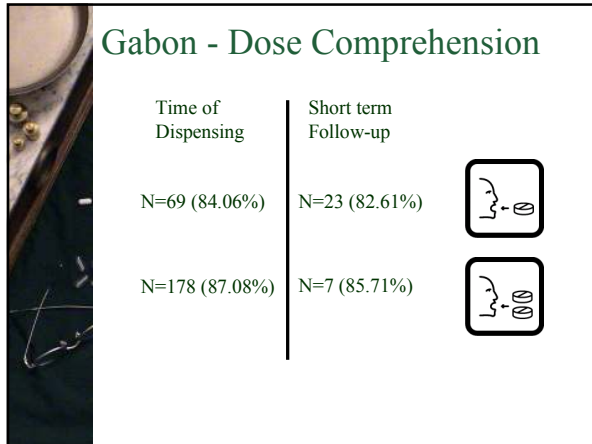
April 2005 – Gabon

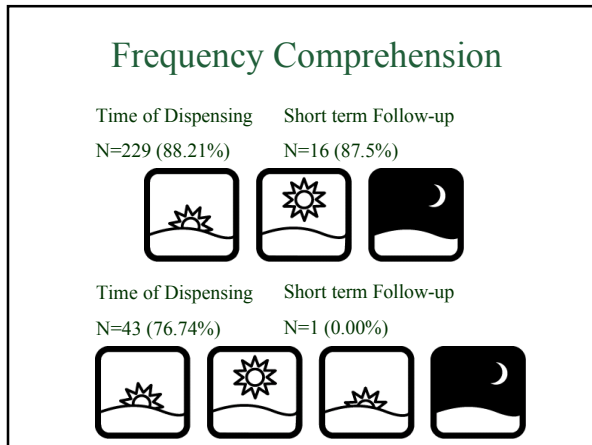
- Design develop and evaluate a pictogram storyboard concept and individual pictograms in an operational context.
- To assess Patient Comprehension of the pictogram elements and storyboard concept both at the time of dispensing and upon short term follow-up

Indication Comprehension



Time of Dispensing	Short term Follow-up
N=525 (81.52%)	N=47 (80.85%)





Conclusion- Gabon

- The vast majority of the pictograms tested reached the European Commission (EC) Standard for comprehension >80%
- Further research will be done to improve and test the practical use of the pictogram storyboard in operational situations especially in regards to the acceptability of the tools by healthcare providers



Culture-specific pictograms to label medications



Online survey

Q6: Take medication in the morning

Pictogram			
Continent of residence	n (%)	n (%)	n (%)
North America	17 (9.7)	95 (54.3)	63 (36.0)
Latin America + the Caribbean	18 (18.2)	66 (66.7)	11 (15.2)
Europe	31 (8.3)	222 (59.2)	122 (32.5)
South-East Asia	3 (17.6)	12 (70.6)	2 (11.8)
Africa Region	14 (26.4)	34 (64.2)	5 (9.4)
Oceania	1 (4.8)	11 (52.4)	9 (42.9)
Eastern Mediterranean	2 (20.0)	8 (80.0)	0 (0.0)
Western Pacific	13 (12.7)	72 (70.6)	17 (16.7)

p < 0.001

Online survey

Q7: Take medication in the evening

Pictogram			
Continent of residence	n (%)	n (%)	n (%)
North America	6 (3.4)	148 (84.6)	21 (12.0)
Latin America + the Caribbean	6 (6.1)	83 (83.8)	10 (10.1)
Europe	17 (4.5)	312 (83.2)	46 (12.3)
South-East Asia	0 (0.0)	10 (58.8)	46 (12.3)
Africa Region	1 (1.9)	38 (71.7)	14 (26.4)
Oceania	0 (0.0)	20 (95.2)	1 (4.8)
Eastern Mediterranean	0 (0.0)	7 (70.0)	3 (30.0)
Western Pacific	4 (3.9)	81 (79.4)	17 (16.7)

p = 0.016

Online survey

Programs selected 15% or less by all continent subgroups (to be eliminated)

Online Survey

Q16: Do you see value in Pictograms


Continent of residence	Yes	No
North America	145 (82.9)	14 (8.0)
Latin America + the Caribbean	89 (89.9)	2 (2.0)
Europe	298 (79.5)	38 (10.1)
South-East Asia	16 (94.1)	1 (5.9)
Africa Region	50 (94.3)	0 (0.0)
Oceania	20 (95.2)	0 (0.0)
Eastern Mediterranean	9 (90.0)	0 (0.0)
Western Pacific	72 (70.6)	14 (13.7)

p=0.010

Pictograms for Management of Type-2 Diabetes

• First Nations, Western Canada

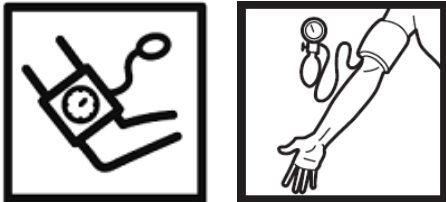
Heart Disease and Stroke



Heart disease & stroke
A

Heart Disease & Stroke
B


Blood Pressure Control



Blood pressure control
A

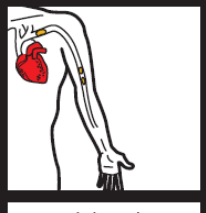
Blood Pressure Control
B

Cholesterol control



Cholesterol control


A



Cholesterol Control

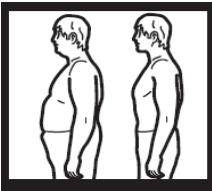
B

Weight loss



Weight loss


A



Weight Loss


B

Blood sugar testing



Blood sugar testing


A



Blood Sugar Testing

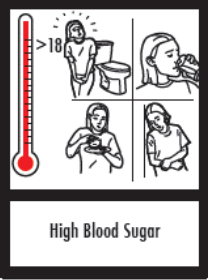
B

High blood sugar



High blood sugar


A



High Blood Sugar

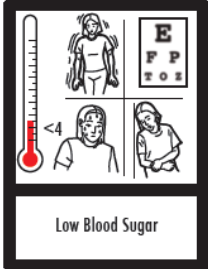
B

Low blood sugar



Low blood sugar

A




Low Blood Sugar

B


Feet examination

A




Feet examination

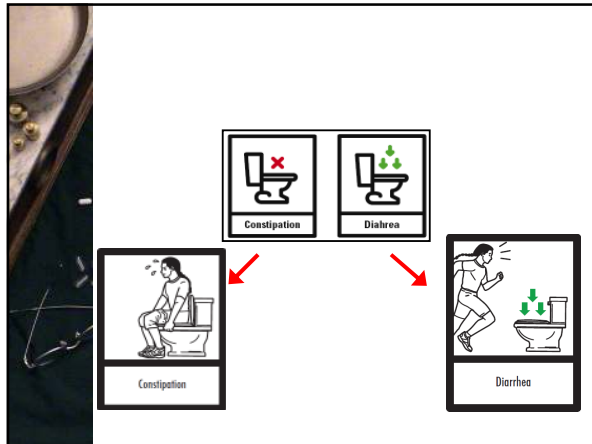
B

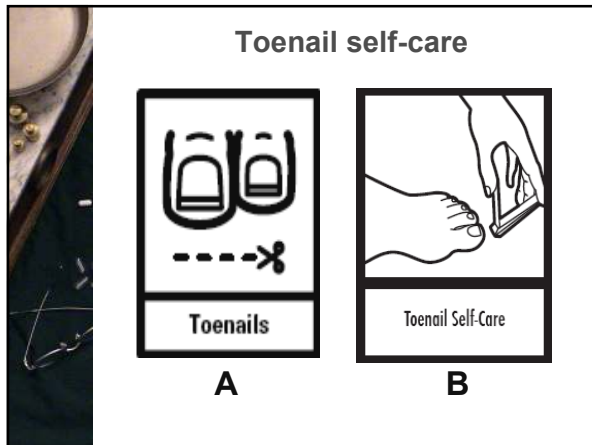


Feet Self-Examination



Foot Examination





Oaxaca, Mexico – November 2008

- High concentration of indigenous people
- Validate and/or revise existing pictograms for culture-specificity
 - Label medications
 - Type-2 diabetes








Hospital de la Niñez Oaxaqueña



...Oaxaca, Mexico

- 80 patients; 44% with inadequate literacy
 - *Short Assessment of Health Literacy in Spanish-speaking Adults (SHLSA-50)*
 - contains 50 test common medical terms
 - A literacy rating calculated based on the number of questions answered correctly.

- Participants with low literacy: 76% comprehension

...Oaxaca, Mexico







FINAL

