A ‘Train the Trainer’ Module for Developing Blood Pressure Screening Programs - 2014

This resource or module is intended to aid an expert to run ‘train the trainer’ sessions for developing blood pressure screening programs. It will be field tested in 2014 and it is expected that an expanded version will be available in 2015. Those using this module/resource are encouraged to submit the evaluation (Section 7 of this resource) and to share their best practices and learnings through the World Hypertension League (www.whleague.org).

The six primary sections of this module/resource cover various areas that are required and essential for successful screening programs. The resource is not intended to be a ‘stand-alone’ program and will require being supplemented with additional resources. Yet, it may be used as a primer to help screen for cardiovascular risk. The World Hypertension League is committed to aiding global dissemination of blood pressure screening programs as a mechanism to the increase diagnosis of hypertension and reduce the burden of hypertension related disease and expects to add resources and material over time via its website (www.whleague.org). This resource may be adopted to your population and to your preference to include translations into native languages and without borders. The World Hypertension League would like to thank the members of the expert group that assisted in creating this module/resource.

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*The Journal of Clinical of Hypertension* is the Official Journal of the World Hypertension League

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Dedicated to the Prevention and Control of Hypertension Globally

World Hypertension League

In official relations with the International Society of Hypertension and World Health Organization

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Section 1. Establishing a Blood Pressure Screening Program

I. The importance of having a blood pressure screening program. High blood pressure is the world’s leading risk for death and disability. An estimated four out of 10 adults over the age of 25 have high blood pressure and about half are unaware that their blood pressure is high. Having a blood pressure screening program in your community can help identify people with high blood pressure readings. People with high readings can then be sent to healthcare professionals to see if they have hypertension and need treatment. Treatment of hypertension prevents stroke, heart and kidney disease.

II. Selecting who should be screened. Hypertension is more common in older adults because blood pressure increases with age. Blood pressure measurement is not expensive and is easy to do. It is best to screen all adults. However, if you have few resources, the most efforts should be devoted to screening older adults. To maximize impact, the program will need to be advertised to those adults you want to screen.

III. Screening for cardiovascular risks in addition to blood pressure. Comprehensive screening for cardiovascular risks involves laboratory testing and is expensive. However, it is easy to ask about cardiovascular risks by using some questions that are on the Blood Pressure Data Collection Form (Section 6). When people are diagnosed with high blood pressure by a healthcare professional they should be tested for diabetes and high cholesterol.

IV. Critical components of a screening program. Critical components include: 1) trained people to measure blood pressure, 2) accurate equipment, 3) educating people on what their blood pressure reading is and what it means, and 4) ensuring that people with high readings have healthcare access and know where they can be assessed for diagnosis and treatment.

V. Involvement of healthcare professionals and non-healthcare professionals in screening programs. Although some screening programs will be conducted by non-healthcare professionals, all programs are recommended to have a healthcare professional involved to make sure blood pressure is measured properly and that people with high blood pressure readings are able to see a local healthcare professional as needed. Any responsible person who is trained to measure blood pressure and is able to provide instructions on blood pressure readings can measure blood pressure in screening programs if support from healthcare professionals is available.

VI. Duration of a screening program. Having an ongoing screening program is very helpful to allow time to let people become familiar with the program, to get the program working well and sometimes even to monitor people over time. If there are not enough resources, screening programs may be short-lasting or intermittent.

VII. Where to set up a screening program. Screening can be performed in most places including work places, stores, community buildings, health care centers or even outdoor settings. The best screening locations are where you expect to find the people you want to screen.
VIII. Information people need after being screened. All people who have their blood pressure measured should be provided written and verbal information about the reading and high blood pressure. A sample *Blood Pressure Data Collection Form* (Section 6) that can be modified is supplied. Unless the person measuring blood pressure is a healthcare professional, personal health advice should not be provided and hypertension should not be diagnosed. Those who appear unwell should be sent to healthcare professionals.

IX. Evaluating the progress and performance of the program. The blood pressure of all people screened should be recorded along with age, sex and, if applicable, antihypertensive drug treatment. It is essential to determine how many people have been screened, how many have hypertension, how many are taking blood pressure drug treatment, and how many have hypertension controlled with drug treatment. Check with healthcare professionals in the area to see if the people screened are being seen, if they are getting treatment and how the program might be improved. If the program has been in operation for several years, you can check with hospitals to see if there are fewer people being admitted for hypertension issues and for strokes.

Web-based resources

Techniques for measuring blood pressure and information on blood pressure devices: [http://hyper.ahajournals.org/cqi/content/full/45/1/142/](http://hyper.ahajournals.org/cqi/content/full/45/1/142/)

Video on how to take blood pressure: [https://sites.google.com/site/yalehappyproject/volunteer-resources/how-to-take-blood-pressure-readings](https://sites.google.com/site/yalehappyproject/volunteer-resources/how-to-take-blood-pressure-readings)

Web-based training video: [http://www.abdn.ac.uk/medical/bhs/tutorial/tutorial.htm](http://www.abdn.ac.uk/medical/bhs/tutorial/tutorial.htm)


Section 2. Selecting a Blood Pressure Measurement Device to Use in a Screening Program

Whether in low-, middle-, or high-resource settings, blood pressure (BP) screening must consistently include a standardized approach to pre-measurement preparation, patient positioning, appropriate cuff selection and placement. One of the most important decisions to make after deciding to run a blood pressure screening program is to select the appropriate type of blood pressure device to be used.
The World Hypertension League and the World Health Organization recommend the use of automated blood pressure devices that have been independently validated and use an upper arm cuff whenever feasible. When this is unfeasible, mercury or recently calibrated aneroid devices can be used. In all circumstances, basic troubleshooting skills and resources should be available.

In low-resource settings, a semi-automated device that has passed international standards for accuracy is recommended whenever possible. These devices can be inexpensive (from less than $20 to about $70 but the price is likely to vary by region and over time). The devices automate the cuff deflation and assessment of the blood pressure reading. Similar to manual techniques, they do require manual inflation and require other standardized steps in patient preparation for blood pressure readings, with a soft wraparound cuff. A list of validated automated blood pressure monitors is at: http://www.dableducational.org/sphygmomanometers/recommended_cat.html (accessed Feb 5 2014). In low-resource areas, the challenge is often the lack of reliable electrical power, which puts a premium on devices that can be recharged via a solar panel and via a cell phone charger. They also can be expected to break periodically requiring replacement. Only upper arm cuff devices are recommended for use except where accurate upper arm measurements are not possible.

A fully-automated device that has passed international standards for accuracy has similar advantages to a semi-automated device but will self-inflate. Some also have a rigid cuff that accounts for differences in arms sizes (within limits). These devices are recommended as an alternative to semi-automated devices in high-resource settings. Devices called AOBP (automated office blood pressure) are available and they can take and average several readings from a screening program participant, thus reducing ‘white coat effect’. Fully-automated devices still require many steps in patient preparation for blood pressure readings. The devices are more expensive (some are under $100 USD but they can be up to $900 USD) and also can be expected to break periodically in difficult environments requiring replacement.

Manual aneroid devices have often been used to assess blood pressure. Although inexpensive, many are out of calibration and inaccurate when assessed in the field. Their use requires regular assessment of calibration utilizing a mercury device and replacing inaccurate devices. The most compelling reasons not to use aneroid devices relates to the extensive training, requirement for good hearing with mastery of auscultatory technique and the need to test and periodically retest accuracy of those measuring blood pressure. The challenge of a consistent level of operator performance and need for training is well recognized. Nevertheless, many still use these devices given the lack of a requisite power source and the fact that it is traditional practice amongst some healthcare professionals. Manual mercury devices are gradually being replaced globally, in part due to environmental concerns about mercury toxicity. Mercury devices are now more expensive but are robust and rarely break. Similar to manual aneroid devices, the use of mercury devices requires the same extensive training, with rigid quality control measures for both manometers and operators. Manual mercury devices require good hearing and
In summary, the challenge of low-resource settings may cause increased complexity and a lack of strict recommendations for the selection of blood pressure measuring devices for BP screening. When possible, the clear recommendation is for validated automatic or semi-automatic oscillometric devices. When challenged by lack of device availability or limited electrical power for direct or battery rechargeable devices, mercury or aneroid manometers may be required. It is important to recognize the need for training in auscultatory technique beyond the standards of pre-measurement preparation, positioning, cuff selection, and basic troubleshooting.

Section 3. How to Organize a Blood Pressure Screening Training Program

There are multiple steps involved in organizing a blood pressure screening training program that the person being trained should perform satisfactorily.

The first step is to determine who will be training people to screen for hypertension, overseeing the program, and measuring blood pressure accurately. The people doing the training for screening or oversight of the program can be healthcare professionals, or in some cases, specially trained healthcare professional students (e.g. medical students). There are comprehensive train the trainer programs that have been developed and these can be simplified by using automated blood pressure devices as this program recommends*.

The next step is to determine who will be responsible for accurately measuring blood pressure during screening. These can be healthcare professionals or non-medical people in the community. These people will need to complete a training program for assessing blood pressure accurately and undergo periodic retesting*. High quality blood pressure assessment needs to be assured by using standard vetted education materials and a standardized training approach (e.g. check sheets)*. Training and accuracy testing with periodic re-testing (e.g. annually) is recommended to confirm the requisite knowledge and skills for accurately measuring BP.

A comprehensive program/training module section should include supervised training of all the people in the program on:

A. Local recommendations for lifestyle modification to prevent and control hypertension. These include a healthy diet including low dietary salt (sodium), lots of fruit and vegetables, lean meats, fish and poultry, regular physical activity, weight loss if overweight or obese, avoiding all tobacco products and excess alcohol.

B. Knowledge about the risks of hypertension (stroke, dementia, renal and heart failure, and heart attack).

* References to programs available online and specific recommendations for training can be provided where applicable.
C. Use of the equipment to be utilized in the screening programs (automatic, or semi-automatic devices are strongly recommended.)

D. How to select and use the appropriate cuff. Cuffs that come with automated devices are marked and those measuring blood pressure need to be able to correctly pick the right size of cuff and have a selection of cuffs available to choose from. People with arm sizes outside of the range of cuffs available should be referred to healthcare professionals for assessment of blood pressure.

E. Blood pressure measuring technique with the selected device. Directions come with the device but should be consistent with the instructions in Section 4 of this module.

F. How to interpret the blood pressure reading and counsel the person screened (see Section 5 of this module).

G. How to refer people urgently to healthcare if required.

Those running the program should be aware of standardized and World Hypertension League’s endorsed education and training resources available from a central repository (www.whleague.org).

### *Blood Pressure Training Assessment*

<table>
<thead>
<tr>
<th>Criteria (K-Knowledge, P-Performance of the person measuring BP)</th>
<th>NA</th>
<th>S</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Able to discuss the need for a comfortable quiet setting for blood pressure reading</td>
<td>K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Able to identify solution if there are problems with the setting, equipment or the person having blood pressure measured</td>
<td>K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Indicates appropriate actions for urgent referral if blood pressure is too high or person acutely ill.</td>
<td>K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Accurately describes appropriate cuff selection</td>
<td>K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Able to indicates that if an arm has consistently higher readings that the higher arm should be used for readings</td>
<td>K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Able to discuss blood pressure variability, the importance of multiple measurements and why hypertension usually cannot be diagnosed at a single visit</td>
<td>K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Indicates knowledge of the role of diet (salt, fruit and vegetables), physical activity, body weight and alcohol consumption to prevent or treat hypertension including local health recommendations</td>
<td>K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Identifies where people with high readings can be seen for routine assessment</td>
<td>K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Appropriately sets up device and turns it on</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Removes restrictive or thick clothing from arm used for measurement</td>
<td>P</td>
<td></td>
<td></td>
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</tbody>
</table>

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## Section 4. Recommended Technique for Measuring Blood Pressure When Screening

### I. Device
- Blood Pressure (BP) measurements should be taken with an automated (oscillometric) device that has passed accuracy testing (http://www.dableducational.org/).
- Proper cuff size should be used according to the manufacturer’s recommendations (use markings on the cuff).

### II. Preparation (picture pending in 2014)
The patient should be resting comfortably in a sitting position for 5 minutes immediately before the measurement.

- The person should not smoke in the screening location.
- There should be no talking during the measurement.
- The person should be seated with back support.
- The arm should be bare and supported with the BP cuff at the level of the heart.
- The legs should not be crossed.

III. Measurement

- Place the cuff so the bladder is centered over the brachial artery.
- Turn on the automated device and perform the measurement. If the device is semi-automated, inflate the cuff above the palpated pulse.
- Blood pressure should be taken in both arms on at least one visit and if one arm has a consistently higher pressure, that arm should be subsequently used for blood pressure measurement and interpretation.
- At least three measurements should be taken in the same arm with the patient in the same position.
- The first reading should be discarded and the latter two averaged.

IV. Recording

- Record the blood pressure.
- Record the arm used, the cuff size and the heart rate.
- Record date, age, gender, and any use of antihypertensive drugs (use Blood Pressure Data Collection Form - Section 6).

Section 5. Interpreting a Blood Pressure Reading

Providing advice based on the blood pressure readings

<table>
<thead>
<tr>
<th>Systolic mmHg</th>
<th>Diastolic mmHg</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;140</td>
<td>&lt;90</td>
<td>Recheck every year</td>
</tr>
<tr>
<td>140 – 179</td>
<td>90-109</td>
<td>Follow up with a healthcare professional within a few weeks</td>
</tr>
<tr>
<td>&gt; 180 – 199</td>
<td>&gt; 110</td>
<td>Follow up with a healthcare professional as soon as possible</td>
</tr>
</tbody>
</table>

If systolic and diastolic are in different categories, follow the recommendation for shorter follow up. In other words, you should always choose the recommendation that will refer the person to a healthcare professional as soon as possible.
Because blood pressures vary throughout the day, week, and even season, you must assure the person that one high blood pressure reading does not necessarily mean they have high blood pressure. However, your recommendation must be based on the blood pressure you obtain at that visit. Those who are pregnant, have chest pain, are short of breath, have difficulty speaking or moving an arm or leg or appear unwell should be sent to a healthcare professional rapidly. For blood pressure readings that are higher, choose a shorter time for rechecks and follow-up. For example, about one half of people with blood pressure readings of 130-139/85-89 will develop hypertension in 4 years. People with blood pressure readings of 160-179/100-109 should be seen within 2 weeks if possible.

A sample letter that can be given to the person screened is below but may require revisions to ensure local language and cultures are respected. A simple diagrammatic version will be available in the resource section but is under development but also may require revisions to ensure local language and cultures are respected.

Your blood pressure is ____/____mmHg with a (circle one) small/medium/large/thigh sized cuff. Your heart rate is ____/minute.

This reading means you should:

1) See a healthcare professional in ________________________________.

2) Get your blood pressure rechecked in ________________________________.

Blood pressure usually needs to be measured many times to be able to tell if your pressure is high, so be sure to get more readings if your reading is high. Also many people will develop hypertension as they get older so make sure to get regular blood pressure readings even if your reading is normal now.

High blood pressure causes strokes, heart attacks, heart failure, and kidney failure. You can lower your blood pressure by getting regular activity, eating fresh vegetables and fruit, and avoiding salty or fatty foods, too much alcohol or any smoking. Many people with high blood pressure will need to take drugs to keep their blood pressure low.
Section 6. Blood Pressure Data Collection Form

Date: _______________  Name: _______________________________________________

Screening number______  Age_______  Gender (Circle one)  Female, Male

Name of Individual Conducting the Screening: __________________________________

1) Have they ever been told by a doctor or other healthcare worker that they have raised blood pressure or hypertension? (Circle one)  Yes,  No

2) Are they currently receiving drugs for high blood pressure (that have been taken in the last 2 weeks) by a doctor or other health worker? (Circle one)  Yes,  No

Reading 1
Systolic (mmHg)____________
Diastolic (mmHg)___________

Reading 2
Systolic (mmHg)____________
Diastolic (mmHg)___________

Reading 3
Systolic (mmHg)____________
Diastolic (mmHg)___________

Average of readings 2 and 3
Systolic (mmHg)____________
Diastolic (mmHg)___________
People with high blood pressure readings who are being asked to see a healthcare professional should be provided with a copy of this data form to take with them. If the blood pressure readings vary by more than 10/5 mmHg consider taking more blood pressure readings. They should also be made aware of the risk for cardiovascular disease.

Consider adding the following optional questions to your data form (Circle either ‘Yes’ or ‘No’)

1) Is the person currently implementing any of the following treatments or advice for high blood pressure by a doctor or other health worker?
   a. advice to reduce alcohol consumption: Yes No
   b. advice to reduce salt intake: Yes No
   c. advice or treatment to lose weight: Yes No
   d. advice or treatment to stop smoking: Yes No
   e. advice to start or do more exercise: Yes No
   f. advice to consume healthier foods and beverages? Yes No

2) Is the person being assessed for or educated on Cardiovascular Disease? Yes No

3) Is the person being assessed for or educated on Type 2 Diabetes? Yes No

4) Does the person have a family history of Cardiovascular Disease? Yes No

5) Was the person’s Body Mass Index (BMI) measured? Yes No

If yes, please indicate the Height, Weight; BMI:
BMI = mass (kg) ÷ [height (m)]² ; BMI = mass (lb) ÷ [height (in)]² x 703.07
BMI Categories (kg/m²)
Underweight = <18.5; Normal weight = 18.5–24.9; Overweight = 25–29.9; Obesity ≥ 30

Section 7. Evaluation on World Hypertension League Blood Pressure Screening Resource

Date:

Name
(Optional):

Email (Optional):

Country where you used the resource:

Would the Region’s Income be considered (Circle One): Low Low-Middle Middle High

Use of resource (Circle One):
1. Community BP screening, 2) Clinic BP screening, 3) other (specify ________________)

What aspects of the resource were most useful?

________________________________________

________________________________________

________________________________________

What was missing from the resource that should be added?

________________________________________

________________________________________

________________________________________

________________________________________
What background resources to support this resource should be added to the World Hypertension League website?

What changes would you recommend when the World Hypertension League updates this resource?

What device(s) did you use in your BP screening program? (manufacturer and exact model)

What were the advantages and disadvantages of the device and approximate costs?
Were there any essential partnerships or sponsors that were utilized during field testing? Circle one Yes or No
If Yes, please indicate who the key partners or sponsors were along with their contact information. Please feel free to attach any success stories along with photographs and/or logos to post on the WHL website (www.whleague.org) and on the WHL Newsletter.

Did you provide any additional educational resources such as hypertension fact sheets, dietary salt awareness or healthy food consumption during assessments? Circle one Yes or No
Did you use this resource as part of World Hypertension Day - May 2015? Circle one Yes or No
Are you willing to be part of the BP screening network in the World Hypertension League to share your best practices and learnings? Circle one Yes (ensure your name and email are indicated), No

Thank you for your time in evaluating this resource. The resource is being field tested 2014-2015 and revisions are expected in 2015-2016. Please E-mail a completed Section 7 Evaluation form along with any requests, questions, or inquiries on this resource to: CEO@whleague.org.