**Rwandan Nurses Saving Lives**
**GG2459030 Final Report**
**HEALTH CENTER NURSES (HCNs)**

**Context**

The primary intent of this Disease Prevention and Management Vocational Training Team (VTT) was to increase the knowledge and skills of frontline nurses working in Health Centers as primary care providers in Rwanda. The Health Center nurse will have completed a high school education in nursing (A2) 3-year (A1) or 4-year (A0) college nursing education program whose focus is the education of hospital nurses. Currently, there is no additional education required to work as a primary care provider in remote locations. These HCNs Rwandan country-wide protocols and procedure for disease management. In addition, it is tradition that physical exams are conducted by physicians. Yet the needs Assessment revealed nurses eager to learn new knowledge and skills to improve the care they can provide. The Rwandan Nurses Saving Lives project indicates dedication to the profession and a wiliness to share the gained knowledge and skills with fellow HCNs.

The Rwandan Nurses Saving Lives project was built on the nursing theoretical framework Novice to Expert by Dr. Patricia Benner. The goal of RNSL is to bring the HCN participants to a competent level to provide safe and effective care concerning all of the conference topics.

**Rwandan Nurses Saving Lives**

The 176 HCNs represented nurses from across the country. In Phase 1 demographic information was obtained for age, gender, education, and years of experience.

| | Range | Average |
|---|---|---|
| Age | 27-62 years | 39.8 years |
| Male Gender | 19-48% per training | 33% |
| Education, A2 | 3.8%-17.6% | 10.7% |
| Education, A1 | 11.5%-37.9% | 27.1% |
| Education, A0 | 50%-84.6% | 61.9% |
| Years of experience | 0.5-31 years | 12.5 years |

**The HCNs were responsible for the following questionnaires:**

1.Knolwedge pre and post conference

2.Skill

3.Virtual Mentorship

4. Clinical Practice. A selected group counted daily counts of clinical activities for 8 weeks

5. HCN experience of conference and mentorship

**Knowledge Questionnaire: all Phases P123**
**PRE and POST CONFERENCE**
**Outcome & Discussion**

| Phase | # | Category | Instrument name | Data Type | #Quest |
|---|---|---|---|---|---|
| 1 | 72 | HCN | Knowledge Questionnaire | Quant | 23 |
| 2 | 72 | HCN | Knowledge Questionnaire | Quant | 24 |
| 3 | 32 | HCN | Knowledge Questionnaire | Quant | 20 |

## Title: HCN Knowledge Questionnaire- Competent level

Phase 1
Dates: July 2024
Locations: Byumba, Rwamagana, and Kagabaga (2 conferences)
Phase 2
Dates: Jan 2025
Locations: Kabguyi and Kabogora (2 conferences)
Phase 3
Dates: Nov 2025
Location: Nyagatare and Gatunda (1 conference)

### Project Component

The knowledge questionnaire was used to measure training effectiveness for the Disease Prevention and Treatment project by assessing Health Center nurse knowledge before and after each conference. Between Phase 1 and Phase 2, the instrument was revised to strengthen reliability and comparability of results: all true/false items were converted to multiple-choice questions, and the Core Team reviewed and approved the revised tool to ensure clarity, cultural appropriateness, and alignment with the conference learning objectives.

During Phase 3 data review, three participants achieved 100% on the pretest, indicating higher baseline knowledge than observed in Phases 1 and 2. Follow-up discussion with Team Heart confirmed that nurses in the Nyagatare and Gatunda zones had received earlier training and

mentorship on cardiovascular disease management and rheumatic heart disease prevention before the Phase 3 conference as part of Team Heart s RHD education mission to selected District Hospitals. This prior exposure is an important contextual factor when interpreting Phase 3 pre/post changes and demonstrates how ongoing mentorship can increase knowledge retention over time.

A Team Heart s nurse educator (also a member of the RNSL Core Team) summarized the prior capacity-building work in the Phase 3 districts as follows:

> Team Heart reported that it had delivered nationwide refresher training on post-cardiac surgery management for noncommunicable disease (NCD) nurses, including those in Nyagatare and Gatunda, and introduced RNSL during that training. Team Heart also noted that mentorship activities in Nyagatare began approximately one year before the Phase 3 conference and included staff briefings and broader instruction on cardiovascular disease and rheumatic heart disease prevention (not limited to echocardiography). District-level nurses were positioned to cascade this knowledge to health centers through ongoing mentoring. As a result, Phase 3 participants arrived with a stronger baseline knowledge than Phase 1 and 2 cohorts, when both trainees and the Core Team were being introduced to protocols for the first time."

**Project Component Evaluation**

A multiple-choice questionnaire (20–24 items, depending on phase) assessed the competent" level content from the Rwandan Nurses Saving Lives (RNSL) modules, including Streptococcus pyogenes infections, acute rheumatic fever (autoimmune response), rheumatic heart disease, heart failure, and prevention strategies. Data were collected as paired pre- and posttests during each conference using participant-generated codes to link results while maintaining privacy. After each phase, the project team completed descriptive statistics (means and score distributions), paired t-tests to assess pre/post change, and item-level analysis to identify questions that performed poorly or revealed knowledge gaps. Findings were used for continuous quality improvement, including revising question wording/format and targeting follow-up education and mentorship where gaps persisted.

**Executive Summary**

This component supported the grant s Disease Prevention and Treatment goals by strengthening the capacity of frontline nurses to recognize, assess, and manage streptococcal infections, acute rheumatic fever, rheumatic heart disease, and heart failure. The assessment tool was structured around the competent" stage of the Patricia Benner Novice-to-Expert framework (entry-level safe and effective practice) and was provided in both English and Kinyarwanda. Across phases, routine item analysis showed that certain formats reduced the accuracy of measurement (e.g., true/false items, all of the above" options, and answers that depended on recognition of advanced medical

terminology). In response, the questionnaire was updated between phases to improve comprehension and the validity of results. Evaluation findings were shared with the Core Team and used to guide targeted refresher teaching and ongoing mentorship to address persistent gaps, supporting longer-term practice change beyond the conference setting.

**Implementation considerations:** The assessment required approximately 60 minutes to complete. To reduce language barriers and improve data quality, tests were available in the participants primary language (Kinyarwanda), and the Core Team provided in-room clarification as needed. In Phase 3, the project piloted electronic data collection using SurveyMonkey to reduce manual data entry time and improve data management.

**Knowledge sustainability**

As expected, participants knowledge increased from pre- to post-conference assessments. Rwandan Nurses Saving Lives (RNSL) was designed to ensure these gains translated into sustained clinical practice by pairing conference-based training with structured virtual mentorship and follow-up on-site mentorship. Knowledge transfer and practice adoption were evaluated through on-site mentorship observations and post-project experience evaluations completed by Health Center Nurses (HCNs) and Clinical Coach Providers (CCPs). This layered train-the-trainer and mentorship model created a practical pathway for frontline nurses functioning as primary care providers to build skills that could be applied at the point of care and reinforced over time. Trained HCNs then disseminated key practices and messages to other staff at their facilities, expanding the project s reach beyond conference participants.

**Lessons Learned:**

1. Competency-based assessment is feasible for complex RHD content, but results depend on the preparedness of trainers (Core Team/CCPs) and require deliberate reinforcement during mentorship.
2. A 20-item assessment can take up to 60 minutes for Health Center nurses; providing a Kinyarwanda version and in-room clarification supports completion and comprehension.
3. Question design affects validity: true/false and “all of the above” formats can mask knowledge gaps; plain-language alternatives improve interpretability.
4. Scenario-based questions were consistently more difficult; they require careful wording, adequate teaching time, and reinforcement during clinical mentoring.
5. Paper testing increases administrative burden and risk of transcription error; electronic tools can improve efficiency and data integrity when connectivity and device access are adequate.

**Recommendations:**

1. Maintain a curated question bank that the host/Core Team can update and select from, supporting consistent measurement across future cohorts.
2. Remove or replace "all of the above" options and avoid item formats that are culturally patterned as "default correct."
3. Use plain-language answers when possible and avoid relying on recognition of advanced medical terms; test comprehension of symptoms and actions instead of terminology.
4. Include a small set of shared anchor questions across competency levels (competent/proficient/expert) to assess knowledge transfer and retention over time.
5. Expand electronic data collection where feasible to support timely analysis and feedback to trainers and health facilities.

**Outcomes (knowledge change):** Pre- and post-conference results showed expected gains in knowledge following training. When combined with on-site mentorship between phases, results indicate progress toward translating knowledge into clinical practice for disease prevention and management.

- Individual score improvement (posttest minus pretest) ranged from 0 to 7 points; the average increase was 3.2 points.
- Across all phases, approximately one-third of participants improved by 0–2 points, one-third by 3–4 points, and one-third by 5–7 points.
- Paired testing (linked by participant codes) enabled within-person comparison; paired t-tests showed statistically significant pre/post improvement at the 95% confidence level.

**Phase 3 HCN Knowledge Questionnaire and Results**

1. A sore throat caused by the bacteria streptococcus pyogenes can then cause _____.

    a. Asthma
    b. Abdominal pain
    c. Mitral valve disease
    d. Anemia

Phase 1 Pretest: Bymuba = 97% correct; Rwamagana = 95% correct

Phase 1 Posttest: Byumba = 100% correct; Rwamagana = 100 % correct

Phase 2 Pretest: Kabguyi = 83% correct; Kiboroga= 88% correct

Phase 2 Posttest: Kabguyi = 100% correct; Kiboroga= 92% correct

Phase 3: Pretest: Nyagatare and Gatunda =78% correct
Phase 3 Posttest: Nyagatare and Gatunda = 97% correct

2. The antibiotic proven to be the best in the treatment of strep throat is _____.

    a. Augmentin
    b. Penicillin
    c. Erythromycin
    d. Doxycycline

Phase 1 Pretest: Byumba = 97% correct; Rwamagana = 69% correct
Phase 1 Posttest: Byumba = 100% correct; Rwamagana =100 % correct

Phase 2 Pretest: Kabguyi = 64% correct; Kiboroga= 80% correct
Phase 2 Posttest: Kabguyi = 100% correct; Kiboroga= 100% correct

Phase 3 Pretest: Nyagatare and Gatunda =84% correct
Phase 3 Posttest: Nyagatare and Gatunda = 100% correct

3. What can happen if a streptococcus pyogenes infection is not treated with the correct antibiotic for the correct amount of time?

    a. The patient can develop scarring of the throat and have a permanent change in voice.
    b. The patient can develop chronic heartburn and permanent changes in the esophagus.
    c. The patient can develop permanent damage to heart valves.
    d. The patient can develop a permanent resistance to the bacteria.

Phase 1 Pretest: Byumba= 73%; Rwamagana = 44%
Phase 1 Posttest: Byumba = 90% correct; Rwamagana =94% correct

Phase 2 Pretest: Kabguyi = 36% correct; Kiboroga= 44% correct
Phase 2 Posttest: Kabguyi = 77% correct; Kiboroga= 77% correct

Phase 3 Pretest: Nyagatare and Gatunda =78%
Phase 3 Posttest: Nyagatare and Gatunda = 100% correct

4. What is the **most effective** way to prescribe and administer the correct antibiotic to treat rheumatic heart disease (RHD)?

    a. Oral: once daily for 7 days
    b. Intramuscular shot (1) every 6 months.

c. Oral: three times a day for 10 days
d. Intramuscular shot (1) every 3-4 weeks

Phase 1 Pretest: Byumba = 39%; Rwamagana = 51%

Phase 1 Posttest: Byumba = 100% correct; Rwamagana = 100% correct

Phase 2 Pretest: Kabguyi = 30% correct; Kiboroga= 19% correct

Phase 2 Posttest: Kabguyi = 28% correct; Kiboroga= 17% correct

Phase 3 Pretest: Nyagatare and Gatunda =31%

Phase 3 Posttest: Nyagatare and Gatunda = 25% correct

**Note: Rwanda has not promoted IM PCN in the country due to the rare anaphylaxis and lack of understanding of side effects versus anaphylaxis. Even at the Core Team level with a cardiologist and physician on the team. It was only after discussing evidenced-based literature and worldwide guidelines did they understand. It was a hard concept for frontline nurses to understand. Team heart continues to support, mentor and educate the nurses in these District Hospital catchment areas.**

**This is the most missed question in all three phases-Yet an important aspect to understand concerning culture. For RHD treatment, in patients with moderate RHD, the most EFFECTIVE treatment is IM PCN every 3-5 weeks. IM PCN will remain at protective levels for approximately 21 days. Monthly PO BID x 10 runs high risk to miss doses, stopping early and failure risks. The current culture is to avoid IM PCN because of fear of anaphylaxis. Yet true understanding of adverse versus anaphylaxis is limited. More education, support, and MOH involvement is required to change policy and behavior.**

5. What is required for a **clinical diagnosis** of strep throat?

a. Fever, cough, sore throat, red throat on exam, sore neck
b. Fever, cough, sore throat, runny nose, swollen lymph glands, swollen tonsils
c. No cough, no runny nose, but has sore throat, swelling or petechiae or pus on tonsils
d. Fever, No cough, sore throat, red throat with swollen tonsils, sore neck with swollen glands, diarrhea

Phase 1 Pretest: Byumba = 73%; Rwamagana = 54%

Phase 1 Posttest: Byumba = 94 % correct; Rwamagana = 97% correct

Phase 2 Pretest: Kabguyi = 25% correct; Kiboroga= 47% correct

Phase 2 Posttest: Kabguyi = 88% correct; Kiboroga= 100% correct

Phase 3 Pretest: Nyagatare and Gatunda =37%

Phase 3 Posttest: Nyagatare and Gatunda = 87% correct

**Note: This question is to assess the knowledge of the clinical diagnosis tool validated for nurses in South Africa. This tool was simplified for nurses working in frontline positions**

**without lab or physician support. In this Rwandan Nurses Saving Lives project, this tool was provided as laminated cards, on posters, and flip charts for the nurses.**

6. Acute rheumatic fever (ARF) is due to a_____ process/response of the body.

    a. Rapid fever
    b. Infectious
    c. Surgical
    d. Autoimmune

Phase 1 Pretest: Byumba = 52%; Rwamagana = 49%

Phase 1 Posttest: Byumba = 100% correct; Rwamagana = 90% correct

Phase 2 Pretest: Kabguyi = 25% correct; Kiboroga= 22% correct

Phase 2 Posttest: Kabguyi = 97% correct; Kiboroga= 75% correct

Phase 3 Pretest: Nyagatare and Gatunda =37%

Phase 3 Posttest: Nyagatare and Gatunda = 91% correct

**NOTE: Understanding the concept of autoimmune versus infection and contagious concepts is critical for nurses to understand and share in community education. Team Heart is continuing education and support of these District Hospitals.**

7. How long after a streptococcus infection can acute rheumatic fever (ARF) occur?

    a. 2-6 days
    b. 1-8 weeks
    c. 3-4 months
    d. 1-2 years

Phase 1 Pretest: Byumba = 30%; Rwamagana = 2%

Phase 1 Posttest: Byumba = 66% correct; Rwamagana = 38% correct

Phase 2 Pretest: Kabguyi = 36% correct; Kiboroga= 31% correct

Phase 2 Posttest: Kabguyi = 88% correct; Kiboroga= 55% correct

Phase 3 Pretest: Nyagatare and Gatunda =31%

Phase 3 Posttest: Nyagatare and Gatunda = 69% correct

**NOTE: At the onset of this project literature supported 1-4 weeks for the autoimmune response. However an additional literature search in July 2024 revealed new data increasing the timeframe to 1-8 weeks as Sydenham chorea in children manifesting cerebral impact could be as late as 8 weeks. Increasing awareness to 8 weeks was critical for nurses working in the frontlines. Education was provided to the Core Team and CCPs of phase 1, all manuals and educational tools (power points, flip charts, and posters were updated). This is important information to link symptoms to a recent strep infection. Yet**

**31% still did not understand the timing. This topic will need continued support by Team Heart.**

8. What main finding will **require an immediate referral** to the district hospital if you suspect acute rheumatic fever (ARF)?

    a. Fever greater than 38
    b. Red swollen tonsils
    c. A heart murmur
    d. High fever and diarrhea

Phase 1 Pretest: Byumba = 66%; Rwamagana = 59%

Phase 1 Posttest: Byumba = 94 % correct; Rwamagana = 87% correct

Phase 2 Pretest: Kabguyi = 69% correct; Kiboroga= 64% correct

Phase 2 Posttest: Kabguyi = 100% correct; Kiboroga= 92% correct

Phase 3 Pretest: Nyagatare and Gatunda = 69% correct

Phase 3 Posttest: Nyagatare and Gatunda = 81% correct

**NOTE: Currently in Rwanda, ARF is rarely diagnosed. The S&S are confusing and do not readily indicate a heart disease. Thus, understanding the importance for transfer to the District Hospital in a child who appears not to have any acute cardiac process specifically for an echocardiogram is important.**

9. What is the ***most common presentation*** of Acute Rheumatic Fever (ARF)?

    e. Fever and muscle spams
    f. Fever and joint pain
    g. Fever and skin rashes
    h. Fever and skin nodules

Note: Phase 1 the question was True or False.

Phase 2 Pretest: Kabguyi = 58% correct; Kiboroga= 58% correct

Phase 2 Posttest: Kabguyi = 92% correct; Kiboroga= 64% correct

Phase 3 Pretest: Nyagatare and Gatunda =72%

Phase 3 Posttest: Nyagatare and Gatunda = 81% correct

10. The **main treatment plan** for Health Center nurses who suspect Acute Rheumatic Fever (ARF) includes:

a. Intravenous fluids
b. Immediate referral to the NCD clinic
c. Paracetamol
d. Calcium Channel Blocker (Nifedipine)

Note: Phase 1 question was True or False.

Phase 2 Pretest: Kabguyi = 50% correct; Kiboroga= 67% correct

Phase 2 Posttest: Kabguyi = 92% correct; Kiboroga= 77% correct

Phase 3 Pretest: Nyagatare and Gatunda =62%

Phase 3 Posttest: Nyagatare and Gatunda = 91% correct

**Note: This question was developed by the Core Team to understand if the HCN nurses recognized the importance of transfer. This is an important understanding of the need to transfer children even if they do not appear acutely ill. The sooner the diagnosis of ARF, the less damage will occur to that child s heart.**

11. What part of the heart is the prime target of rheumatic heart disease (RHD)?

a. The heart muscle
b. The mitral valve
c. The sinus node
d. The aortic arch

Phase 1 Pretest: Byumba = 70%; Rwamagana = 51%

Phase 1 Posttest: Byumba = 91% correct; Rwamagana = 74% correct

Phase 2 Pretest: Kabguyi = 69% correct; Kiboroga= 78% correct

Phase 2 Posttest: Kabguyi = 100% correct; Kiboroga= 100% correct

Phase 3 Pretest: Nyagatare and Gatunda =84%

Phase 3 Posttest: Nyagatare and Gatunda = 97% correct

12. How can nurses prevent acute rheumatic fever (ARF) and rheumatic heart disease (RHD)?

a. Early recognition and management of streptococcal sore throat infections
b. Vaccination against streptococcal infection
c. Effective management of syphilis during pregnancy
d. It's an autoimmune condition for which no effective prevention has been discovered

Note: Phase 1 the question was True or False.

Phase 2 Pretest: Kabguyi = 64% correct; Kiboroga= 58% correct

Phase 2 Posttest: Kabguyi = 92% correct; Kiboroga= 88% correct

Phase 3 Pretest: Nyagatare and Gatunda =62%

Phase 3 Posttest: Nyagatare and Gatunda = 91% correct

**NOTE: This Rwandan Nurses Saving Lives project is the first in the world to provide a path to decrease incidence through nurses by educating a clinical tool to use evidenced-based research to assess, diagnose, and correctly treat Strep throat and impetigo.**

13. A patient with moderate to severe heart failure will have which of these physical changes:

    a. Shortness of breath and swelling of the feet
    b. Cough at nighttime and a fullness of the stomach
    c. Inability to complete daily activities and being tired or fatigued.
    d. All of the above

Phase 1: Byumba = 82%; Rwamagana = 51%

Phase 1 Posttest: Byumba = 100% correct; Rwamagana = 85% correct

Phase 2: Kabguyi = 64% correct; Kiboroga= 58% correct

Phase 2 Posttest: Kabguyi = 86% correct; Kiboroga= 86% correct

Phase 3: Nyagatare and Gatunda =84%

Phase 3: Posttest: Nyagatare and Gatunda = 88% correct

**Note: After phase 3 the VTT learned that in Rwanda s educational system All of the above" is usually correct and is chosen almost always. Future implementation at Nurses saving Lives will change all questions with this answer choice. During the heart failure lecture, these signs and symptoms were new information to the HCN participants s evidence by the questions and discussions during that lecture.**

14. Which disease is contagious?
    a. Strep throat
    b. Acute Rheumatic Fever
    c. Rheumatic Heart Disease
    d. Sydenham Chorea

Note: Phase 1 and 2 the question was True or False.

Phase 3 Pretest: Nyagatare and Gatunda =44%

Phase 3 Posttest: Nyagatare and Gatunda = 84% correct

**Note: Review of this question indicates good education of the presenters. However, this is a critical concept, thus continued reinforcement of contagious ability of the streptococcus pyogenes and auto immune response to the bacteria is important for Team heart to maintain.**

15. A child with Acute Rhematic Fever (ARF) can present with a fever and _____.
    a. unusual emotions with laughing, crying, of yelling at the wrong times.
    b. shortness of breath with a fullness (pressure or heaviness) in the chest
    c. being so tired that the child is late to school or cannot play sports

d. All of the above

Note: Phase 1 and 2 the question was True or False.

Phase 3 Pretest: Nyagatare and Gatunda =75%

Phase 3 Posttest: Nyagatare and Gatunda = 87% correct

**Note: This question was developed from phase 1 and phase 2 concerning the unknown and unique symptoms of ARF. However, the us3e of all of the above" invalidates the pre-conference results because by tradition all of the above" is the correct answer in Rwanda. The pilot, Phase 1 and Phase 2 clearly indicate the S&S of ARF are unknown by HCNs. This question needs to be rewritten.**

16. At what age range is Strep throat's autoimmune complications most common?

a. 3 to 7 years old
b. 5 to 15 years old
c. 16 to 22 years old
d. All ages have equal complication risk

Phase 1 Pretest: Byumba = 41%; Rwamagana = 51%

Phase 1 Posttest: Byumba = 100 % correct; Rwamagana = 100% correct

Phase 2 Pretest: Kabguyi = 8% correct; Kiboroga= 33% correct

Phase 2 Posttest: Kabguyi = 100% correct; Kiboroga= 100% correct

Phase 3 Pretest: Nyagatare and Gatunda =47%

Phase 3 Posttest: Nyagatare and Gatunda = 97% correct

**NOTE: This is a key concept for HC nurses to recognize that young children can and will be having ARF and RHD. These data shows this concept is taught well.**

17. The most important class medication for **all** heart failure patients is _____.

a. Antiarrhythmic (Amiodarone)
b. Antibiotic (Penicillin)
c. Diuretic (Furosemide)
d. Calcium Channel Blockers (Nifedipine)

Phase 1 Pretest: Byumba = 58%; Rwamagana = 15%

Phase 1 Posttest: Byumba = 82% correct; Rwamagana = 23% correct

Phase 2 Pretest: Kabguyi = 8% correct; Kiboroga= 11% correct

Phase 2 Posttest: Kabguyi = 33% correct; Kiboroga= 88% correct

Phase 3 Pretest: Nyagatare and Gatunda =41%

Phase 3 Posttest: Nyagatare and Gatunda = 87% correct

**NOTE: Understanding required medications to reduce fluid buildup in the lungs, legs, and abdomen (ascites) created by a failing heart is important to improving quality of life and cardiac status. The proper use of furosemide (available in Rwanda) is required education concerning clinical practice of HF patients. Throughout the phases of NSL, the Core team gain knowledge and skills to teach this concept. This is a critical nursing care concept that can be used on every patient with heart failure from any etiology. This gap of knowledge reinforces the danger of employing nurses as frontline primary care providers without a strong education in pharmacology. This Nurses Saving Lives project provides pharmacology education for the narrow scope of RHD and heart failure, yet can save many lives of those impacted with HF.**

**Phase 1 and 2 had an  All of the above" which was the most commo wrong answer. In Phase 3 an example for each class was added.**

18. Nurses should use a stethoscope to_____

    a. Evaluate tonsillar exudate
    b. Determine an enlarged spleen
    c. Auscultate (listen for) cardiac murmurs
    d. Assess if disease is from a virus or bacteria

Note: Phase 1 the question was True or False.

Phase 2 Pretest: Kabguyi = 75% correct; Kiboroga=  78% correct
Phase 2 Posttest: Kabguyi = 100% correct; Kiboroga=  97% correct

Phase 3 Pretest: Nyagatare and Gatunda =81%
Phase 3 Posttest: Nyagatare and Gatunda = 91% correct

**Note: Nurses are understanding what stethoscopes are used for, however the review of the clinical practice data indicates that nurses are still concerned whether nurses should be using stethoscopes…or only physicians. This concern will need support from Team Heart as they mentor the nurses in these District Hospitals. In addition, the Rwandan Biomedical Center and Minister of Health can support nurses working as primary care providers to use their stethoscopes correctly and effectively.**

19. New research concerning Sydenham Chorea indicates that the peak age is 7-9 year olds and can impact up to 70% cases of ARF.  What symptoms impacting school would alert you to check for ARF?

    a. Being late to school and walking home and a decline in sports activities.

    b. New anxiety and depression and emotional events in school.

    c. A decrease in vocabulary, ability to speak, and handwriting.

    d. All the above

Note: Phase 1 the question was True or False.

Phase 2 Prestest: Kabguyi = 39% correct; Kiboroga= 72% correct

Phase 2 Posttest: Kabguyi =88% correct; Kiboroga= 100% correct

Phase 3 Pretest: Nyagatare and Gatunda =75%

Phase 3 Posttest: Nyagatare and Gatunda = 91% correct

**Note: The pre-conference result is not interpretable due to the all of the above". This information is new to nurses. The question needs to be rewritten. All S&S of ARF were new knowledge to all HCN participants as evidence of questions and discussions during the conference presentations.**

20. Treatment for moderate to severe RHD includes:
    a. Penicillin every 3-4 weeks
    b. Daily diuretic medication
    c. Mechanical valve replacement
    d. All of the above

Note: Phase 1 and 2 the question was True or False.

Phase 3 Pretest: Nyagatare and Gatunda =59%
Phase 3 Posttest: Nyagatare and Gatunda = 78% correct
**Note: Interesting pretest score in P3 as tradition for selecting All of the above" as the default answer is high. It may denote that the nurses read the question and truly considered the answers.**

## Physical Exam Skills Questionnaire
## HCN Participants
## Phase 1, 2 and 3

| Phase | # | Category | Instrument name | Data Type | #Quest |
|---|---|---|---|---|---|
| 1 | 78 | HCN | HCN-POST SKILL | Quant | 18 |
| 2 | 37 | HCN | HCN-POST SKILL | Quant | 18 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 31 | NCH | HCN-PRE & POST SKILL PAIRED TESTS | Quant | 18 |

**Locations**
Phase 1
Dates: July 2004
Locations: Byumba, Rwamagana, and Kagabaga (2 CONFERENCES)
Phase 2
Dates: Jan 2025
Locations: Kabguyi and Kabogora (2 CONFERENCES) Note: At Kabguyi, time did not permit the post skills training testing.
Phase 3
Dates: Nov 2025
Location: Nyagatare and Gatunda (1 CONFERENCE)

**SUMMARY**

The *Rwandan Nurses Saving Lives (RNSL)* initiative is a capacity-building project designed to strengthen the clinical assessment skills of frontline nurses serving as primary care providers in Rwanda s health centers. Aligned with Rotary International s Area of Focus in Disease Prevention and Treatment, and supportive of Maternal and Child Health, the project builds local clinical capacity through sustainable skills transfer, practical mentorship, and measurable improvement in patient assessment practices. Health Center Nurses (HCNs), who may hold either certificate- or bachelor-level nursing preparation and function under national guidelines with diagnostic and prescribing responsibilities, often enter practice with limited formal training in comprehensive history-taking and physical examination, including use of the stethoscope and otoscope. In response, RNSL provided both essential diagnostic tools and structured hands-on training in HEENT, respiratory, cardiac, and abdominal examination skills.

**Project Component**:

This project component focused on building essential physical assessment skills needed for the early recognition and management of streptococcal infections, acute rheumatic fever, rheumatic heart disease, and heart failure. Training was delivered through a *Vocational Training Team (VTT)* process and a layered train-the-trainer model with emphasized practical, hands-on learning through six clinical skills stations. The instructional design prioritized skill acquisition, confidence in tool use, and application of findings to timely referral and treatment decisions at the health-center level.

**Project Component Evaluation**: Evaluation of this training component used direct observation, a structured multiple-choice skills questionnaire, and follow-up mentorship assessment. Members of the VTT, Core Team, and Certified Conference Presenters (CCPs) provided instruction and observed participant performance during the training sessions. CCPs also conducted on-site mentorship visits 7 to 8 weeks after the conferences to assess whether newly taught skills were being applied in clinical practice. Additional evaluation methods included verbal case-based discussion and direct observation in patient-care settings. A quantitative questionnaire for the skills training was used at the conference. The same skills questionnaire was used across participant groups, including Core Team members, CCPs, and HCNs, to support consistent review of training outcomes.

**Executive Summary**

In Phases 1 and 2, participants completed only a post-training skills questionnaire because conference schedules did not allow sufficient time for both pre- and post-testing. In Phase 3, the nurse training schedule was expanded to three full days, making it possible to administer both pre- and post-tests and thereby strengthen the evaluation of skills training outcomes. Although there was an increase in strict numbers of correct answers, it was the on-site mentorship process where the CCPs monitored patient physical exams to know that the HCNs were performing skills at a competent level was known.

**Lessons Learned:**

1. Participants responded very positively to receiving personal stethoscopes and otoscopes, and for many this was their first opportunity to hear heart and breath sounds directly using their own equipment.
2. Effective skills training required strong time management. Many station facilitators were initially more comfortable explaining tool use than coaching hands-on practice, which highlighted the importance of standardized flipcharts and guided demonstration.
3. Some examination techniques required adaptation to local practice patterns. For example, asking a patient to say “ahh” loudly and using a tongue depressor with a light source to visualize the tonsils were new skills for many HCN participants.
4. HCN participants demonstrated strong motivation to learn and practice new clinical assessment skills.
5. The training also highlighted differences between traditional learning approaches and the project’s practice-based model, underscoring the need for repeated supervised application of new skills.
6. Small-group instruction worked well. Groups of approximately six participants per station, with paired practice, provided an effective balance of demonstration, participation, and feedback.

7. The 18-question post-training skills test required approximately 45 minutes to complete, which should be factored into future conference scheduling.

**Recommendations:**

1. Use both pre- and post-testing whenever possible, and maintain a three-day conference format to support stronger evaluation of skills acquisition.
2. Develop a question bank that includes host-club input and prioritizes skill-based items that reflect the actual scope of practice of HCN participants. Clarify the type of question that are best for the population being tested.
3. Use test results to guide future training priorities, targeted mentorship, and follow-up support in clinical practice settings by question analysis after each conference.
4. Ensure that Core Team training delivered by the VTT includes the full skills curriculum, regardless of participants' prior self-assessment, because Core Team practices and teaching habits directly influence HCN learning.
5. Continue advocacy with Team Heart, the Core Team, and the Ministry of Health for reliable access to quality stethoscopes, reinforcement of nurse-led physical examination in routine practice, and ongoing mentorship to sustain clinical skill development.
6. Increasing the conference to 3 days can allow to implement more interactive educational scenarios using skills to increase skills training time.

**Data Analysis**

### Paired tests Analysis

In Phases 1 and 2 the main conference for frontline nurses working as primary care providers in health centers was allotted 2 days for cost containment. Due to time, the pre skills test was eliminated as each test added 45-60 min. In Phase 3 the Rwandan team felt they could provide a better experience if the pace was slowed and increased to 3 days. Thus, a pre skills test was added. This addition allowed paired test analysis.

### Phase 3 N=31 paired tests

Pre skills section: minimum score 4/18; maximum score 14/18; average score 9/18 points (50%)
Post skills section: minimum score 6/18; maximum score 15/18; average score 12 points (67%)
Score gain after education: minimum gain +0; maximum gain +7; average gain 3.2 points

**Note:** Rwandan culture for learning skills is to learn the basics through verbal discussion. Each person having the tool (stethoscope and otoscope) is new. The actual practice time is also a new concept. The onsite mentorship provided an 8 week post conference skill assessment which reveals skills are being used. The clinical practice sheets provided by a selected group of HCN nurses reveals that the use of the stethoscope everyday is still limited due to busy schedules where nurses see between 25 and 80 patients per day.

**Skills Questionnaire, Rationale and Results**
**HEENT:**

4. When assessing for a potential Strep Throat, which of the following symptoms would make you consider this sore throat is NOT strep throat?

a. A throat with red spots instead of white pus on tonsils
**b. A child with a persistent cough and runny nose**
c. A child who has been nauseated and may have vomited

Phase 1 Posttest: Byumba = 54% correct; Rwamagana = 88% correct
Phase 2 Posttest: Kiboroga= 35% correct
Phase 3: Pretest: Nyagatare and Gatunda = 48% correct
Phase 3 Posttest: Nyagatare and Gatunda = 72% correct

**RATIONALE:**

runny nose and cough are highly suggestive of viral infections and not related to strep infections. The South African Criteria (The Cape Town Clinical Decision Rule for Streptococcal Pharyngitis in Children for children ages 5 to 15) included no runny nose or cough as requirements for a clinical diagnosis of Strep Throat. Children with strep with severe swelling can have nausea and vomiting. The red spots are petechiae which indicate Strep.

5. What HEENT physical finding would indicate an emergent need to refer to a physician to rule out meningitis?

a. Fever greater than
**b. Pain with passive or active range of motion of the neck**
c. Ringing in the ears
Phase 1 Posttest: Byumba = 95% correct; Rwamagana = 93% correct
Phase 2 Posttest: Kiboroga= 70% correct
Phase 3: Pretest: Nyagatare and Gatunda = 72% correct
Phase 3 Posttest: Nyagatare and Gatunda = 93% correct

**RATIONALE:** simple ROM of neck causes pain because it moves the spinal column and is a medical emergency.

6. You are checking a child for Strep throat, but when inspecting the oral cavity, you cannot see well, what should you do?

a. Have patient cough while you look
**b. Use a tongue depressor**
c. Hyperextend the neck

Phase 1 Posttest: Byumba = 95% correct; Rwamagana = 95% correct
Phase 2 Posttest: Kiboroga= 70% correct
Phase 3: Pretest: Nyagatare and Gatunda = 81% correct
Phase 3 Posttest: Nyagatare and Gatunda = 93% correct

**RATIONALE:** This is a critical concept and skill. Every nurse participant MUST use a tongue depressor to see the tonsils. Common misuse of the tongue depressor was noted during VTT mentored skill sessions.

**RESP- Normal**

8. To listen to the breath sounds you need to use the _____ side of the stethoscope.

**a.** **Diaphragm**

**b.** Bell

**c.** Either one will work well

Phase 1 Posttest: Byumba = 95% correct; Rwamagana = 97% correct
Phase 2 Posttest: Kiboroga= 73% correct
Phase 3: Pretest: Nyagatare and Gatunda = 58% correct
Phase 3 Posttest: Nyagatare and Gatunda = 75% correct

**Note:** There are 3 questions concerning the use of the stethoscope. There appears to have persistent confusion. The stethoscope is a new tool for most Rwandan nurses. This reinforces the importance to follow up and provide mentorship to HCN nurses on the use of the stethoscope.

9. To help you hear breath sounds better have the patient _____.

A. Breath slowly through the nose
B. Breath slowly through the mouth
C. Breath forcibly through the mouth

Phase 1 Posttest: Byumba = % correct; Rwamagana = % correct
Phase 2 Posttest: Kiboroga= 35% correct
Phase 3: Pretest: Nyagatare and Gatunda = 32% correct
Phase 3 Posttest: Nyagatare and Gatunda = 58% correct

**RATIONALE:** slow breathing allows fluid sounds to be faint. A forceful expiration allows sounds to be magnified.

**Note:** Recommendation is continued mentorship, education and support of the proper use of the stethoscope by Team Heart and the CCPs.

10. The right middle lobe of the lung is heard _____

a. At the middle of the back, right side
**b.** **Under the arm about breast level, right side**
c. At the middle of front chest, right side

Phase 1 Posttest: Byumba = 46% correct; Rwamagana = 79% correct
Phase 2 Posttest: Kiboroga= 81% correct
Phase 3: Pretest: Nyagatare and Gatunda = 39% correct
Phase 3 Posttest: Nyagatare and Gatunda = 32% correct

**RATIONALE:** The right lung has three lobes. The middle lobe is only exposed mid-axillary line and heard about the 4-6 intercostal spaces, or breast level. this concept was finally taught and understood in Kibogora. The reason this is important is that the #1 spot for an inhaled foreign body.

**Note:** Recommendation is continued mentorship, education and support of the proper use of the stethoscope by Team Heart and the CCPs. This is a critical landmark for pulmonary auscultation assessments.

11. Which of the following are functions of the respiratory system?
    a. Acid-base balance
    b. Storage and filtration of blood for systemic circulation
    c. Inspiration, expiration, and ventilation
    **d. All of the above**

Phase 1 Posttest: Byumba = 67% correct; Rwamagana = 82% correct
Phase 2 Posttest: question exchanged
Phase 3: Pretest: Nyagatare and Gatunda =45 % correct
Phase 3 Posttest: Nyagatare and Gatunda = 64% correct

**Note:** Upon review of all levels of skills and knowledge, the complete understanding of the functions of the respiratory system is lacking from Competent to Expert level. For this conference, discussions with the host cardiology team would need to determine whether the contents of respiratory function should be removed as this is a knowledge question. In addition, the use of "all of the above" negates the ability to assess the question as it the answer of choice.

**RESP- Abnormal**

10. Fluid congestion in the lungs is common in Heart Failure patients. What does this HF fluid (pulmonary edema) sound like?
**a. Fine crackles like rubbing hair together.**
**b.** Water bubbles like blowing air in a straw in your drink.
**c.** Louder wet sounds like fine rain hitting the roof.

Phase 1 Posttest: Byumba = 73% correct; Rwamagana = 57% correct
Phase 2 Posttest: Kiboroga= 46% correct
Phase 3: Pretest: Nyagatare and Gatunda = 58% correct
Phase 3 Posttest: Nyagatare and Gatunda = 75% correct

**RATIONALE**: Understanding normal and abnormal respiratory sounds are critical concepts to using a stethoscope. Every provider using a stethoscope MUST know normal and abnormal sounds. Consider building an auditory file to use during skills rotation.

**Note:** This is an interesting pre skills result as HCN nurses rarely have access to a stethoscope. There may have been some knowledge translation from the NCD nurses. The post skill correct answer shows good teaching by the presenting team on this skill station.

11. You are listening to a patient and you hear abnormal breath sounds, what technique do you use to determine whether the fluid is in the lung versus the bronchial-tracheal tree?

**a.** **Have the patient cough and relisten, pulmonary edema will stay the same**

**b.** Have the patient take deeper breaths while listening, the fluid in the bronchial-tracheal tree will go away.

**c.** Have the patient stand up and bend over 3 times to move the fluid and reassess, the pulmonary edema will go away.

Phase 1 Posttest: Byumba = 59% correct; Rwamagana = 57% correct
Phase 2 Posttest: Kiboroga= 43% correct
Phase 3: Pretest: Nyagatare and Gatunda = 45% correct
Phase 3 Posttest: Nyagatare and Gatunda = 66% correct

**RATIONALE:** Fluid in the can be fine or coarse. Coarse pulmonary edema sounds similar to rhonchi. However, having a patient cough will clear rhonchi. This is an important skill to understand to complete a good resp exam and it impacts critical decision-making. Providing a stethoscope to providers places the requirement of understanding normal versus abnormal and critical thinking of the skill is on the person providing the scope (core team and CCP). Pulmonary edema from pneumonia, HF, TB, congenital heart disease, ARF, RHD, other infections, exposure to toxins (especially used in agriculture), or trauma of the chest wall, or severe malnourishment. Rhonchi (coarse sounds in the bronchial tree can be from allergies, toxins, smoke, viral upper respiratory, foreign body (in nose and infected) or in bronchial tree (swallowed/inhaled small toy/food/object). Every provider must know that if you have the patient cough before you listen will clear rhonchi and rales stay the same.

**Note:** This is an interesting P3 pre skills result as HCN nurses rarely have access to a stethoscope. There may have been some knowledge translation from the NCD nurses. The post skill correct answer shows good teaching by the presenting team on this skill station.

**CARDIAC-Normal**

14. When listening to the heart, which part of the stethoscope will allow the best sound transmission for murmurs?

a. The diaphragm

**b.** **The bell**

c. The equalizer

d. All parts are equal

Phase 1 Posttest: Byumba = 84% correct; Rwamagana = 68% correct
Phase 2 Posttest: Kiboroga= 41% correct
Phase 3: Pretest: Nyagatare and Gatunda = 29% correct

Phase 3 Posttest: Nyagatare and Gatunda = 52% correct

**RATIONALE:** the sounds of murmurs are low pitch and heard best with the bell LIGHLTY placed on the chest. This is a critical skill in the cardiac exam.

**Note:** There appears to have persistent confusion. The stethoscope is a new tool for most Rwandan nurses. This reinforces the importance to follow up and provide mentorship to HCN nurses on the use of the stethoscope.

15. When listening to the heart, which part of the stethoscope do you use to hear the normal (lub-dub) heart sounds best?

**a. The diaphragm**
b. The bell
c. The equalizer
d. All parts are equal

Phase 1 Posttest: Byumba = 86% correct; Rwamagana = 84% correct
Phase 2 Posttest: Kiboroga= 76% correct
Phase 3: Pretest: Nyagatare and Gatunda = 45% correct
Phase 3 Posttest: Nyagatare and Gatunda = 66% correct

**RATIONALE:** The pitch of the sounds created from blood changing direction when valves open and close are high-pitched and are best heard with the diaphragm firmly placed on the chest in proper location. This is a critical skill of the cardiac exam.
Note: There appears to have persistent confusion. The stethoscope is a new tool for most Rwandan nurses. This reinforces the importance to follow up and provide mentorship to HCN nurses on the use of the stethoscope.

16. When listening to the heart, how many different locations do you need to listen to for a complete assessment?

a. 2
b. 3
**c. 4**
**d.** 5

Phase 1 Posttest: Byumba = 3% correct (86% chose D); Rwamagana = 0% correct (93% chose D)
Phase 2 Posttest: Kiboroga= 3% correct (84% chose D)
Phase 3: Pretest: Nyagatare and Gatunda = 42% correct
Phase 3 Posttest: Nyagatare and Gatunda = 48% correct

**Note:** Review of this question indicates that the Core Team taught this question to the Expert level where Erb's point was included in the education. However, Erb's point is the site where S1 and S2 are heard at the same intensity. For NCD and HCN nurses, listening at each site of specific cardiac murmurs are 4 sites and the only required. Interestingly, when score by the Core team "D" was the selected correct answer.

17. You are having troubles hearing the heart sounds clearly, what can you do so you can hear better?

a. Have the patient cough before listening to the heart

**b. Have the patient lean forward while listening to the heart**

c. Have the patient run in place to increase the heart rate before listening

d. Have the patient hold their breath while listening to the heart

Phase 1 Posttest: Byumba = 11 % correct; Rwamagana = 23% correct
Phase 2 Posttest:; Kiboroga= 22% correct
Phase 3: Pretest: Nyagatare and Gatunda =23% correct
Phase 3 Posttest: Nyagatare and Gatunda = 55% correct

**RATIONALE:** If you cannot hear the heart sounds well, you can have the patient lean forward bring the heart closer to the chest wall and therefore louder. This is a critical skill to improve the ability to hear heart sounds.

*If you cannot determine if a rubbing sound is from the heart or lungs, then have the patient hold their breath.

**Note:** Review of this question shows an inadequate knowledge of the Core team as they used "D" as the correct answer which is incorrect and developing a habit of patients holding their breath can lead to problems as the cardiac auscultation takes time. Having a patient lean forward allows the heart to move towards the chest wall in increase the quality of sound.

**CARDIAC- Abnormal**

17. What physical exam supports the diagnosis of an enlarged heart and heart failure?

**a. You can feel for an enlarged point of maximum intensity- it will be big and deviated left**

**b.** You can assess for jugular vein distension

**c.** An abnormal cardiac exam with a loud murmur in the mitral location

**d.** All of the above

Phase 1 Posttest: Byumba = % correct; Rwamagana = % correct
Phase 2 Posttest: Kiboroga= 65% correct
Phase 3: Pretest: Nyagatare and Gatunda = 22% correct
Phase 3 Posttest: Nyagatare and Gatunda = 22% correct

**RATIONALE:** A heart that is both enlarged and in failure will always have a left lateral deviated PMI that is big. However, JVD is related to fluid overload and well treated HF patients with an enlarged heart can be well managed on medications and have no JVD.
Likewise, not all enlarged hearts or HF have loud murmurs.

**Note:** Review of this question shows an inadequate knowledge of the Core team as they used "D" as the correct answer which is incorrect for the critical thinking of an enlarged heart. Not all enlarged hearts are in fluid over load and not all fluid over load are from an enlarged heart. This question was designed for critical think and separation of cardiac enlargement versus heart failure.

Again, the "All of the above" may have driven the Core team to assume that was the correct answer.

18. When you are making a referral to the District hospital NCD clinic for a cardiac murmur, what do you need to communicate to the NCD nurse concerning the murmur?

**a.** **Location**
**b.** Intensity
**c.** Radiation
**d.** All of the above

Phase 1 Posttest: Byumba = 30% correct (67% chose D); Rwamagana = 5% correct (95% chose D)
Phase 2 Posttest: Kiboroga= 54% correct
Phase 3: Pretest: Nyagatare and Gatunda = 16% correct
Phase 3 Posttest: Nyagatare and Gatunda = 16% correct (78% chose D)

**Note:** The review of this question may indicate that the Core Team did not separate Expert knowledge and competent knowledge. The intent of this question was for HCN nurses referring to the NCD clinic. HCN nurses were to be taught normal cardiac sounds and anything else is abnormal and requires an echo. Thus, the only requirement is location. It is the NCD nurses' responsibility to know which valve and to listen for location, intensity, radiation, and thrills. The core team grading used "D" as the correct answer. One can also assume the 71.9% "D" responders in the pretest followed the test-taking tradition that "All of the Above" is most commonly correct (this test-taking tradition was not shared with the VTT until after the completion of the Phase 3) Education of Core team needs to be reinforced.

19. You suspect that your patient has carditis, what can you do to confirm the sound is from the heart?

**a.** Have the patient cough before listening to the heart
**b.** Have the patient lean forward to listen to the heart sounds
**c.** Have the patient run in place to increase the heart rate before listening
**d.** **Have the patient hold their breath while listening to the heart**

Phase 1 Posttest: Byumba = 76% correct; Rwamagana = 48% correct
Phase 2 Posttest: Kiboroga= 32% correct
Phase 3: Pretest: Nyagatare and Gatunda = 35% correct
Phase 3 Posttest: Nyagatare and Gatunda = 35% correct

**RATIONALE:** The rubbing sounds of pericarditis and the pleural friction rub are similar in character. However, one is heard with breathing and the other by the heart contracting. If you cannot determine if a rubbing sound is from the heart or lungs, then have the patient hold their breath. Thus, if the sounds are still heard, then it is the heart.
Carditis is a common finding in ARF and the primary time of the autoimmune process that involves the entire pericardium. As ARF becomes RHD the impact isolated in the valves. Thus, this is an important physical exam skill.
Note: This is a critical skill to help determine the faint scratch of carditis versus breath sounds. This is a critical thinking skills that aids in diagnosis of ARF. Review of the Core Team and CCP, indicate good knowledge. However the knowledge translation at the cardiac skills station indicates poor

knowledge translation. Recommendation is to have Team Heart continue to provide education, support and mentorship of the Phase 3 HCNs.

**ABDOMEN**

19. Which abdominal assessment can be done to help your decision concerning fluid overload?

a. Check for an enlarged spleen
b. A heel-thump test
**c. Check for hepato-jugular reflux**
d. All of the above

Phase 1 Posttest: Byumba = 40% correct; Rwamagana = 68% correct
Phase 2 Posttest: Kiboroga= 57% correct
Phase 3: Pretest: Nyagatare and Gatunda = 32% correct
Phase 3 Posttest: Nyagatare and Gatunda = 19% correct

**RATIONALE:** Hepato-jugular reflux is related to fluid: if the heart cannot handle the excess fluid, it can be pushed backwards to the liver. If the liver is compressed and there is fluid overload, then the fluid will be pushed into the jugular and can be seen. The heel-thump test is for inflamed intestines, and an enlarged spleen is related to past infections.
**Note:** A review of the CCP and Core Team Skill test indicate there was understanding, yet these results indicate a lack of understanding. An explanation may be the team doing the Abdominal skills flip chart taught all three tests and did not clarify fluid overload versus surgical assessments. In addition, the "All of the Above" is the most common answer by tradition. Recommendation is for Team heart to continue to provide education, support and hands on education for there HCNs and change question to eliminate "all of the above".

20. You are caring for a child with complaints of abdominal pain. You what to rule out a surgical emergency. What assessments can you do?

a. Listen to bowel sounds
b. A heel-thump test
c. A Psoas test
**d. All of the above**

Phase 1 Posttest: Byumba = 86% correct; Rwamagana = 68% correct
Phase 2 Posttest: Kiboroga= 84% correct
Phase 3: Pretest: Nyagatare and Gatunda = 64% correct
Phase 3 Posttest: Nyagatare and Gatunda = 81% correct

**RATIONALE:** A full exam is needed to determine the level of emergency- listening to bowels sounds to abnormal (amount, pitch, none) aid critical thinking; the heel-thump and Psoas test are simple test that indicate inflamed intestines and are highly indicative of an abnormal emergency.

**Note:** Revise question to remove "all of the above." To better understand knowledge and skill appreciation.

**Health Center Nurses- Virtual Mentorship**

| **Phase** | # respond | Category | Instrument name | Data Type | Questions |
|---|---|---|---|---|---|
| **1** | 18 | HCN | WhatsApp/Virtual Mentorship | Mixed | 19 Likert<br>1 open ended |
| **2** | 14 | HCN | WhatsApp/Virtual Mentorship | Mixed | 12 Likert<br>10 strengths<br>1 open ended |
| **3** | 16 | HCN | WhatsApp/Virtual Mentorship | Mixed | 12 Likert<br>10 strengths<br>2 open ended<br>8 difficulties |

**Project Component:** The virtual mentorship component was designed to extend conference learning by giving Health Center Nurse (HCN) participants continued access to conference presenters for review, mentoring, and encouragement in applying newly acquired knowledge and skills. WhatsApp was selected as the platform for this mentorship because it is widely used across Rwanda and is the primary mobile messaging tool for communication. This innovative approach provided two months of post-conference support through participants personal phones, with the goal of helping HCNs sustain active use of conference content and strengthen clinical practice during the post-training period. The Core Team developed the mentorship content and delivery approach. For implementation, each Core Team member was paired with a Certified Conference Presenter (CCP) and assigned to a WhatsApp group of six HCNs. These small groups were established during the in-person skills training so that relationships could begin before the virtual mentorship phase. Based on its broad accessibility and strong acceptance, WhatsApp was recommended by the Core Team as the preferred platform for this component.

**Project Component Evaluation:** This component was evaluated using a single mixed-methods questionnaire administered after completion of the mentorship period. The questionnaire included both quantitative and qualitative items. Revisions were made across phases in response to data

review and feedback from Core Team discussions in order to strengthen the evaluation process and better capture participant experience.

**Lessons learned:**

1. This innovative and cost-effective approach to continuing education improved communication, strengthened confidence, and supported the translation of knowledge and skills into clinical practice. The findings suggest that virtual mentorship contributes to sustainability and continued use of conference learning.
2. WhatsApp was universally accepted by participants and proved to be a practical and accessible platform for mentorship delivery in Rwanda.
3. The virtual mentorship model should be shared with the Rwanda Ministry of Health and the Rwanda Biomedical Centre for consideration in other health education initiatives for Health Center Nurses, in collaboration with the Core Team and project partner Team Heart.
4. Scenario content should be developed during Core Team training and VTT mentorship preparation to ensure that all materials are evidence-based, contextually appropriate, and suitable for delivery through a virtual platform.

**Recommendation:**

The findings indicate broad participant support for using WhatsApp as a tool for continued post-conference education. Virtual mentorship appears to strengthen participants application of conference knowledge and skills, while also promoting efficient use of time and resources and supporting the development of collegial relationships. The model also created an accessible channel through which HCN nurses could raise clinical questions and concerns with mentors. Based on these outcomes, the Core Team and Team Heart should share the results with the Ministry of Health and the Rwanda Biomedical Centre to encourage broader adoption of this approach for ongoing support and continuing education for Health Center Nurses.

Phase 1
Category: HCN
Dates: Sept 1-Nov 1 2024
Locations: virtual via a WhatsApp platform.
N=18

**Phase 1 Quantitative Data Analysis**

Instrument description – this questionnaire was developed to assess how the Core team members felt the impact of a virtual mentorship to the nurse participants. The quantitative data was limited to a Likert scale 0 (no impact) to 5 (high impact).
See appendix for instrument.
How did you think the WhatsApp mentorship helped you to learn, share, or gain confidence in the conference topics?

| Conference topic | Likert Composite |
|---|---|
| 1.Strep infections | 4.7 |
| 2.Using the clinical diagnostic tool for strep throat | 4.5 |
| 3. Prescribing antibiotics for strep infections | 4.9 |
| 4. Understanding ARF signs and physical symptoms | 4.6 |
| 5. Understanding the emotional symptoms of ARF | 4.2 |
| 6. RHD in the clinical setting | 4.2 |
| 7. Clinical diagnosis of Heart failure | 4.3 |
| 8. providing education on conference topics | 4.3 |
| 9. Assistance with history and physical exam | 4.5 |
| 10.Using the stethoscope | 4.9 |

Using the WhatsApp mentorship, how did your mentor do with...

| Concept | Likert Composite |
|---|---|
| 1.Building trust relationships | 4.5 |
| 2.Improving communications | 4.7 |
| 3. Increasing knowledge | 4.7 |
| 4. Remembering key concepts | 4.4 |
| 5. Discussing scenarios | 4.2 |
| 6. Mentoring critical thinking | 4.7 |
| 7. Sharing successes/cases | 4.6 |
| 8. Encouraging use of stethoscopes | 4.6 |
| 9. Empowering Nurse | 4.9 |

**Phase 1 Qualitative Data Analysis**
Instrument description – It was important to gain an understanding of the potential of using a post-conference WhatsApp platform in the virtual mentorship component. This is important information for the MoH for other nursing education and for the project as it has a financial impact to the project. The question was asked:

Do you think the WhatsApp mentorship is a good tool for Rwanda? WHY?

All 18 HCN nurses reported that this 2-month virtual mentorship using the WhatsApp platform should be continued. Common themes reported included that the virtual mentorship increases knowledge and skills; it was easy to share experiences and ask questions; and it is cheap, does not require travel, and uses time wisely.

Quotes:

P1HCN8. Yes, It is good because it saves time and improves communication which at any time I can chat with my mentor for more clarification and then we can share the knowledge."

P1HCN10. Yes, -Communicating (WhatsApp mentorship) by phone is easy and eliminates the need for travel. -You can communicate and discuss from any location, day or night. Thank you"

P1HCN15. Yes, because it increases our knowledge by discussion and also it improves our communication. And it helps the nurses to share experience, trust and it creates a strong relationships between the nurses from different facilities."

**Phase 2**
Category: HCN
Dates: Feb 1-April 1 2025
Locations: virtual via a WhatsApp platform.
N=14

**Tool changes:** After Action discussions from Phase 1 included a desire to understand the correlation between how one perceived the impact of the virtual relationship on clinical practice and the strengths of their mentors (both core team and CCPs).

**Phase 2 Quantitative Data**
How did the WhatsApp mentorship help you?

| **Concept** | **Likert Composite** |
|---|---|
| 1.Building trust relationships | 4.9 |
| 2.Improving communications | 4.7 |
| 3. Increasing knowledge | 4.6 |

| | |
|---|---|
| 4. Remembering key concepts | 4.4 |
| 5. Discussing scenarios | 4.4 |
| 6. Mentoring critical thinking | 4.0 |
| 7. Sharing successes/cases | 4.5 |
| 8. Encouraging use of stethoscopes | 4.5 |
| 9. Empowering nurses | 4.5 |
| 10. Gain confidence in understanding the pathology of disease processes | 4.4 |

How did your confidence level change over the course of your training and mentoring from the Core team and Certified Presenters using WhatsApp? Rate the following 0-5 on how much the mentorship increased your confidence level.

| | |
|---|---|
| 11. Before training | 2.5 |
| 12. After training, and participating in the mentorship with health center nurses | 4.5 |

Please indicate which areas were strengths of your mentor from the certified conference presenter team and or core team during WhatsApp:

| **Areas of Strength** | **% reporting strength of their mentor and Core Team member** |
|---|---|
| 13. Building trust relationships | 100% |
| 14. Improving communications | 91% |
| 15. Increasing knowledge | 100% |
| 16. Remembering key concepts | 91% |
| 17. Discussing scenarios | 100% |
| 18. Mentoring critical thinking | 100% |
| 19. Sharing successes/cases | 100% |
| 20. Encouraging use of stethoscopes | 100% |

| | |
|---|---|
| 21. Empowering Nurses | 91% |
| 22. Frequently and readily available | 91% |

**Phase 2 Qualitative data**

23. Do you think the WhatsApp mentorship is a good tool for Rwanda? WHY?

All of the HCN reported that the Virtual mentorship is a good tool for Rwandan nurses. Knowledge, time, and ease were common themes. In addition 9 nurses stated an important aspect of the virtual mentorship was the ability to have a knowledgeable person to ask clinical questions and share cases to ensure the treatment plan is correct.

P2HCN1. The WhatsApp mentorship is good because once I help manage a case of rheumatic heart fever and submit it to WhatsApp group the way I managed it, this will help me immediately to know where I committed error or where I didn t do anything and yet it should be done, intervene of a helped case."

P2HCN3. Because they provide needed skills to the nurses, especially to the health centers as the one near for community. They provided needed materials. I appreciate the way of their training. Keep courage , and continue the project."

P2HCN8. It helped us to get some information, collaboration then we use it to communicate our mentors when we meet difficulties or ask them advice on management of hard cases."

P2HCN15. Because it promotes communication and sharing Information. It helps to get feedback It helps developpe and get new knowledge."

**Phase 3**
Category: HCN
Dates: Nov 25 2025-March 15, 2026
Locations: virtual via a WhatsApp platform.
N=16

**Tool changes:** Review of the Phase 1 and 2 and discussions with the Core Team had identified difficulties that had been voiced by previous HCN participants. Thus, a new section was added to verify these identified difficulties.

**Phase 3 Quantitative Data**:

| Concepts | |
|---|---|
| 1.Building trust relationships | 4.5 |
| 2.Improving communications | 4.7 |

| | |
|---|---|
| 3.Increasing knowledge | 4.6 |
| 4.Remembering key concepts | 4.4 |
| 5.Discussing scenarios | 4.5 |
| 6.Mentoring critical thinking | 4.4 |
| 7.Sharing successes/cases | 4.6 |
| 8.Encouraging use of stethoscopes | 4.8 |
| 9.Empowering nurses | 4.4 |
| 10.Gain confidence in understanding the pathology of disease processes | 4.6 |

How did your confidence level change over the course of your training and mentoring from the Core team and Certified Presenters using WhatsApp concerning the conference topics of Streptococcus pyogenes infections, ARF, RHD, and HF?

| Confidence | Likert |
|---|---|
| 11. Before training | 1.2 |
| 12. After training, and participating in the virtual mentorship | 4.3 |

Please indicate which areas were strengths of your mentor from the certified conference presenter team and /or core team during WhatsApp:

| Areas of Strength | % reporting positive strength of mentors |
|---|---|
| 13.Building trust relationships | 100% |
| 14.Improving communications | 100% |
| 15.Increasing knowledge | 100% |
| 16.Remembering key concepts | 100% |
| 17.Discussing scenarios | 100% |
| 18.Mentoring critical thinking | 100% |

| | |
|---|---|
| 19.Sharing successes/cases | 100% |
| 20.Encouraging use of stethoscopes | 100% |
| 21.Empowering Nurses | 100% |
| 22.Frequently and readily available | 100% |

23. Do you think the WhatsApp mentorship is a good tool for nurses? YES NO

10 respondents said YES" and 6 respondents did not answer

24. Why?

In Phase 3 the nurses reported similar responses with no transportation required, it refreshes knowledge, it improves knowledge and skills. Five respondents did not provide an answer.

P3HCN10. Accessibility: Nurses can communicate anytime and anywhere, even in remote areas. · Quick support: Questions about patient care or clinical situations can be answered promptly. · Knowledge sharing: Mentors can share guidelines, resources, and best practices easily. · Encouragement and networking: It builds connections and peer support among nurses. · Cost-effective: No need for travel or in-person meetings, saving time and resources."

P3HCN13. It is an excellent tool for support because it fast-paced and distant."

Difficulties with your WhatsApp mentorship. Write Yes" to all difficulties you experienced.

| Difficulties to my availability to use the WhatsApp mentorship | YES | NO |
|---|---|---|
| 25. I am too busy at work | 50% | 50% |
| 26. I can only respond at nighttime after work and I am too tired | 44% | 56% |
| 27. Family commitments prevented me from using WhatsApp well | 31% | 69% |
| 28.I did not have internet access | 19% | 81% |
| 29.No one ever checked on me to see if I needed help | 6% | 94% |
| 30.No one responded to me when I submitted questions | 12% | 88% |

| | | |
|---|---|---|
| 31.The weekly discussion was only a certain time and I could not attend | 6% | 94% |
| 32. The scenarios were too complex for me to understand and use in clinical practice | 12% | 88% |

33. Any other comments to share? None provided

**Rwandan Nurses Saving Lives**
**Complied HCN Nurse Participant Experience**
**Phase 1 and 2**

| **Phase** | # respond | Category | Instrument name | Data Type | # Questions |
|---|---|---|---|---|---|
| **1** | 19 | HCN | **Understanding your experience** | Qualitative | 5 open ended |
| **2** | 8 | HCN | **Understanding your experience** | Qualitative | |

- Phase 3 this questionnaire was eliminated due to time placed on the HCN nurses. An informal discussion was done at the time of the training.

Phase 1
Category: HCN
Dates: October-November 2024
Locations: Byumba, Rwamagana, Kibagabaga
N= Byumba (6), Rwamagana (6), Kibagabaga (7)

Phase 2
Category: HCN
Dates: March-April 2025
Locations: Kabguyi and Kibogora
N= 7

**Project Component:** This questionnaire was designed to gain an understanding of the experience of the training and mentorship of the HCN.
**Project Component Evaluation:** The qualitative questionnaire is composed of five open ended questions with an optional 6th "anything else" question. Handwritten answers were transcribed into a word document. Typed answers were copied as written. All responses were compiled into a single document. The data was reviewed by two nurses and a physician with qualitative data analysis experience. Common themes were reviewed and

discussed. These questionnaires were sent to the nurses who agreed to complete the data post conference. This questionnaire was sent at 12-week post conference via email.

**Summary:** The HCN nurse participant experiences carried common themes of the importance of the nurses to gain knowledge about the full spectrum of RHD and skills to assess, diagnose, treat and follow patients. In addition, the concepts of nursing empowerment through enhanced confidence leading to the desire to advocate through education community and colleagues. Unexpected barriers expressed included the decline of payment for 10 days of PCN by the country's health insurance and push back from the HC supervisors to change from 7 days to 10 days of PCN and lack of supplies including tongue depressors at some healthcenters.These represent areas where national-level policy changes can create the change needed to save children's lives from RHD. Several nurses noted that the local pharmacists also inadvertently prompted a truncated antibiotic regiment by only giving 5 days of PCN to families who could not pay for 10 days and told them to come back if the child was not better. The natural course of the Strep throat is to improve within first 5 days, thus filling prescription for less than 10 days results in undertreated children ultimately increasing the risk of the ARF autoimmune response. The experiences shared provided additional support for the virtual mentorship as an effective way to help the nurses to continue to use the knowledge and skills gained as build their confidence on clinical decision making.

**Lessons Learned and Recommendations:**

1. Qualitative data is rich yet requires a researcher trained in qualitative data review for common theme development.
2. Some of the stories share show great professional growth of the nurse during the training.
3. Using open-ended questions may allow for a more honest expression of opinion and sharing of barriers.
4. Utilization of this questionnaire would depend on the data management system and time commitment of the people conducting analysis. Recommendation is for electronic submission of typed questionnaire responses.

**Questions**

1. **Please describe the difference in how you assess, diagnose, provide care and refer your patients after attending the conference and mentorship?**

   **The common themes were the recognition that obtaining a history and physical dramatically impacts the nurse's ability to critically think and make good clinical decisions. The knowledge and skills started from the conference seems to have impacted the HCN and empowered the nurses to desire to practice their new knowledge and skills to improve their care.**

   P1HCN9. "Before attending the conference and mentorship assessment and diagnosis process was made in poor way as long as I didn't have enough skills and knowledge. But after attending I acquire knowledge and skills by which help me to improve how I assess and diagnose which then lead me to provide better treatments and referring plan properly."

   P1HCN4. "There is improvement in our assessed, diagnosis, provide care and refer patients because my knowledge and skill are increased."

   P2HCN4. "After attending the conference and mentorship, I became more systematic in assessing patients, especially those with symptoms suggestive of strep throat, acute rheumatic fever (ARF), or early signs of rheumatic heart disease (RHD). Before, I might

have focused on general symptoms, but now I pay close attention to sore throats, joint pain, skin rashes, and heart murmurs. My diagnostic thinking has improved, and I can now confidently use clinical tools and criteria like the Jones Criteria for ARF. I also became more proactive in making timely referrals for echocardiograms or cardiology review when needed. The mentorship taught me to act earlier, leading to quicker diagnosis and better outcomes for my patients."

P2HCN6. "Before this program, my confidence was very low, and I didn't have enough skills based on evidence or standardized concepts and I could have doubts about what I was doing. But now, I know how to access diseases based on standardized guidelines and evidence and my confidence has increased which enable me to provide good care to patients."

2. **Assessing, diagnosis, and referring patients to physicians requires knowledge, skills, and personal confidence. Please compare your confidence level before and after the education and mentorship program applying your knowledge and skills to increase your patients' access to care and early referrals for cardiac evaluations. How does your confidence impact your care?**

   **Every nurse responded with increased confidence after the conference. Knowledge, skills, the history and physical exam were the most common reported as impacting the confidence level.**

   P1HCN1. "Confidence level before are low knowledge about screening, physical assessment and to take decision, and I had fear to refer rheumatic fever. Nurses delayed the patients to refer to high level due to low knowledge. After I have full confidence level about to take decision, patients assessment, diagnosis and treatment. Refer patients early in order to save lives of clients."

   P1HCN3. "Sharing my knowledge with physicians who receive my referring patients I have a positive result in my cardiac evaluation on my patients received and do corrected good management the patient with cardiac problems after conference and mentorship."

   P1HCN12. "After attending the conference and mentorship I diagnose confidently and prepare to refer to hospital and without any hesitation. This has impacted me excellently."

   P2HCN4. "Before the training, I often doubted my ability to identify early signs of RHD and was hesitant to refer unless symptoms were severe. After the education and mentorship, my confidence has significantly improved. I now trust my assessment skills and knowledge, which allows me to make informed decisions quickly. This confidence means I'm more assertive in advocating for my patients, ensuring they are referred early for cardiac evaluations, which is critical in preventing complications. It also improves the trust between me and the patient, as I can explain the condition and plan of care clearly."

   P2HCN2. "After mentorship, knowledge and skills are increased: To know history of patients, good assessment, diagnosis and treatment and education to the patient and referring to the level Hospital."

3. **For nurses to make changes in providing healthcare, it is important to understand what the barriers and facilitators to NCD nurses increasing their role and capacity as high-**

**quality healthcare providers. Describe your greatest barrier and your activities that help you provide care for RHD and refer to cardiology.**

**Barriers recognized by the HCN nurses included-**
**Poverty is a barrier to referring patients to a higher level of care; the nurses have little time to complete full history and physical exam on every patient; HC policy that would not allow the nurses to write for 10-days of antibiotic; and insurance would not pay for the 10-day PCN prescriptions.**

P1HCN6. "Greatest barrier is that many people in community not know more about strep throat, ARF and RHD . What we do is to provide health education in the community about strep throat, ARF and RHD."

P1HCN13. "The greatest barrier on healthy center is lack of time to asses clients because you have many clients and also you appointed in two or three services at the same time and also materials are not available used in assessment but we try to change the routine by acauranging [arranging] all health care providers to know the impact of early detection of RDH."

P1HCN9. "The greatest barrier was a limited core knowledge to my colleagues' nurses in my working place by which some of them fail to adopt the new changes, so they remain doing routines then the second one was the issue of insurances especially CBHI which reject to pay for some medication due to the duration of treatments."

P2HCN4. "The greatest barrier is limited access to diagnostic tools like echocardiograms at health centers. Also, some patients delay seeking care due to lack of awareness or transport issues. To overcome this, I focus on patient education—informing families about the dangers of untreated sore throats and the importance of early medical care. I also collaborate closely with local community health workers (CHWs) to do follow-ups and encourage early visits."

P2HCN8. "My greatest barrier in providing care for strep throat, ARF and RHD is the lack of resources and time constraints. To overcome this, I engage in continued professional development and seek support from colleagues and mentors."

4. **Considering the overall course, please share how you think nurses can save the lives of children and young adults with strep throat and rheumatic heart diseases?**

**The overwhelming action to save lives was to provide education to the community, schools, and other nurses**.
P1HCN8. "We have a hard work : increase awareness about strep throat from pyogenes: in co-workers, in community, at school ,health education is needed everywhere in order to save live. We have to treat properly those affected people."
P1HCN10. "Nurses can save the lives of children and young adults with strep throat and rheumatic heart diseases if they identify strep throat and if they treat it good. They can prevent the complications of arf, RHD and heart failure. They can educate the population how to prevent strep throat."
P2HCN4. "Nurses can save lives by acting as the first line of defense. By promptly recognizing and treating streptococcal throat infections with antibiotics, they prevent the progression to ARF and RHD. Nurses play a critical role in education, teaching

families and schools about the importance of early treatment. They also ensure patients with suspected RHD are followed up and referred for cardiac evaluations. By being vigilant, informed, and proactive, nurses greatly reduce the long-term complications of RHD in children and young adults."

5. **Share an experience about how you provided for one of your patients using your new knowledge and skills from this conference and mentorship.**

P1HCN6. "What I can share about my experience after conference and mentorship I received patients of 14 years with complain of repeated sore throat and dysphagia and his parents not know that can be treated at health facilities after complete assessment and physical exam the diagnosis was strep throat and was treated with penicillin v for 10 days and I gave him and his parents health education about strep throat ,ARF and RHD after that the parents was happy about that."
P1HCN9. "I received a client who has signs and symptoms but his mom doesn't know about strep throat instead she emphasizes on malaria so that after assessment and diagnosis and further clarification she recognizes that strep throat is very dangerous. Then this pushes me to put much more efforts in health education sessions in order to give information to many people as soon as possible."
P1HCN12. "Using strep throat checklist and tools I found different patients with strep throat exhibiting different signs and symptoms like exudate petechiae dysphasia and fatigue. I gave her penicillin 250 milligrams 2 tablets per day for 10 days. After some days she was improved and successful to treatment."
P2HCN4. "One day, a young girl came in with a sore throat, joint pain, and mild fever. Previously, I might have treated the symptoms separately. However, using what I learned, I quickly suspected possible ARF. I did a thorough examination and coordinated a referral to the district hospital for echocardiography. She was diagnosed early and started on secondary prophylaxis. The family was thankful, and this experience showed me the power of early detection and the impact of our nursing role in preventing lifelong heart damage."
P2HCN7. "I was assigned to a young patient diagnosed with rheumatic heart disease I was able to assess and refer him for getting. Utilizing the knowledge gained from the conference I explained rheumatic heart disease in simple terms I discussed how it was developed from untreated strep throat and the importance of regular checkups and medication adherence."

6. **Any additional information or experiences you would like to share with the conference team?**

P1HCN 15. "This program help me in assessing, diagnosis and management of strep throat ARF and RHD. This program help to increase knowledge and skills especially use of stethoscope to hear heart sound. This program help to discuss with other health care NCD nurses about different scenario and it 's their management and how we can prevent strep throat ARF, RHD from community. In my conclusion I recommend if possible to continue this program and reach to all NCD nurses."
P2HCN1. "Few that I can add are to thank everyone who supports this action to reach on its success. Another thing is to request that this mentorship must be decentralized to many nurses in order to have many able and capable workers to save lives together. Hence better health in our Country."

P2HCN6. "Something that I can tell you is that this mentorship program is very useful for nurses, so, it should be implemented in many hospitals especially those in rural are as there

are many cases of ST, ARF and RHD which are not being discovered hence this can lead to deaths unknowingly."

Attachment:

**Rwandan Nurses Saving Lives**
**Health Center Nurses- Understanding your experience**

1) Please describe the difference in how you assess, diagnose, provide care and refer your patients after attending the conference and mentorship?

2) Assessing, diagnosis, and referring patients to physicians requires knowledge, skills, and personal confidence. Please compare your confidence level before and after the education and mentorship program applying your knowledge and skills to increase your patients' access to care and early referrals for cardiac evaluations. How does your confidence impact your care?

3) For nurses to make changes in providing healthcare, it is important to understand what the barriers and facilitators to NCD nurses increasing their role and capacity as high-quality healthcare providers.
    a. Describe your greatest barrier and your activities that help you provide care for ST, ARF, and RHD and refer to cardiology.
    b. Describe the best activity/person that help you provide care for ST, ARF, and RHS patients and refer to cardiology.

4) Considering the overall course, please share how you think nurses can save the lives of children and young adults with strep throat and rheumatic heart diseases?

5) Share an experience about how you provided support for one of your patients using your new knowledge and skills from this conference and mentorship.

6) It is through your attendance, dedication, and implementation of the knowledge and skills that we can develop the program to offer to other NCD nurses in Rwanda. Is there anything about the conference or WhatsApp, or mentorship you would like to share?