# Do reminder systems improve the effectiveness of tuberculosis diagnosis and management?

Adherence to treatment, and diagnostic and treatment appointments is essential for effective tuberculosis (TB) detection and treatment. Reminder systems are sometimes used to remind patients to take their TB medication or to attend appointments (pre-appointment reminders), or to contact patients who have missed an appointment (default reminders).

## Key message

→ **For patients being treated for active TB**
  – Default reminders probably increase the number of patients completing treatment and may increase clinic attendance
  – Pre-appointment reminders may increase clinic attendance and the number of patients completing treatment

→ **For people on TB prophylaxis, pre-appointment reminders may increase clinic attendance.**

→ **For people undergoing screening for TB, pre-appointment reminders may have little or no effect on the number of people who return to clinic for the result of their skin test.**

→ **Due to the low certainty of the evidence, more well-designed trials are needed to establish whether reminder systems are effective in different settings, and the best way of delivering reminders, especially in low-income countries.**

## Who is this summary for?

People making decisions concerning the effectiveness of tuberculosis diagnosis and management.

## ! This summary includes:

– **Key findings** from research based on a systematic review
– **Considerations about the relevance of this research** for low-income countries

## ✗ Not included:

– Recommendations
– Additional evidence not included in the systematic review
– Detailed descriptions of interventions or their implementation

## This summary is based on the following systematic review:

Liu Q, Abba K, Alejandria MM, et al. Reminder systems to improve patient adherence to tuberculosis clinic appointments for diagnosis and treatment. Cochrane Database of Systematic Reviews 2014, Issue 11. Art. No.: CD006594.

## What is a systematic review?

A summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research, and to collect and analyse data from the included studies

**SUPPORT** was an international project to support the use of policy relevant reviews and trials to inform decisions about maternal and child health in low- and middle-income countries, funded by the European Commission (FP6) and the Canadian Institutes of Health Research.

**Glossary of terms used in this report:**
www.supportsummaries.org/glossary-of-terms

**Background references on this topic:**
See back page

# Background

Tuberculosis (TB) is a major contributor to the global burden of disease, particularly in low-income countries. Common screening and diagnostic procedures require clients to return for test evaluation, and treatment requires adherence to schedules over extended periods of time. Adherence to diagnosis and treatment appointments and medication schedules is essential for effective TB detection and treatment, and for efficient health-care resource use. Adherence to treatment is also key to minimising the emergence of drug resistant TB. Pre-appointment reminders are systems used to contact patients and remind them to take their medication or to attend upcoming appointments for TB diagnosis or treatment. Default reminders are systems used to contact patients who fail to keep scheduled appointments.

## Knowing what's not known is important

A reliable review might not find any studies from low-income countries or might not find any well-designed studies. Although that is disappointing, it is important to know what is not known as well as what is known.

A lack of evidence does not mean a lack of effects. It means the effects are uncertain. When there is a lack of evidence, consideration should be given to monitoring and evaluating the effects of the intervention, if it is used.

## About the systematic review underlying this summary

**Review objective:** To assess the effects of reminder systems and 'late patient tracers' on the completion of diagnostics, the commencement of treatment in people referred for curative or prophylactic treatment of tuberculosis, the completion of treatment in people starting curative or prophylactic treatment for tuberculosis, and cure rates in people being treated for active tuberculosis.

| Types of | What the review authors searched for | What the review authors found |
|---|---|---|
| **Study designs & Interventions** | Randomised trials, non-randomised trials or controlled before-after studies of any actions taken to remind patients to take their TB medication or attend appointments (pre-appointment reminders) or to contact patients who have missed an appointment (default reminders) | 6 trials of pre-appointment reminders and 3 trials of default reminders |
| **Participants** | Children and adults requiring TB treatment, TB prophylaxis, or referred for TB diagnostics or screening | People on treatment for active TB (4 studies), prophylaxis for latent TB (1), undergoing TB screening using skin tests (3), and undergoing TB diagnosis, chemoprophylaxis, or treatment (1) |
| **Settings** | Any setting | Pre-appointment reminders: USA (4), Spain (1), and Thailand (1); Default reminders: India (2) and Iraq (1) |
| **Outcomes** | Completion of TB diagnostics; completion of screening process; commencement of prophylactic treatment; commencement of curative treatment; completion of prophylactic treatment; completion of curative treatment; cure; incidence of active tuberculosis | The main outcomes assessed were the number of patients who adhered to a scheduled appointment and cure for pre-appointment reminders (6 studies) and the number of patients who completed treatment for default reminders (3) |

**Date of most recent search:** August 2014

**Limitations:** This is a well-conducted systematic review with only minor limitations.

Liu Q, Abba K, Alejandria MM, Sinclair D, et al. Reminder systems to improve patient adherence to tuberculosis clinic appointments for diagnosis and treatment. Cochrane Database of Systematic Reviews 2014, Issue 11. Art. No.: CD006594.

# Summary of findings

Nine studies were identified that assessed different pre-appointment reminders (6 studies) and default reminders (3 studies). The studies of pre-appointment reminders were conducted in the USA (4), Spain (1) and Thailand (1) and predominantly tested interventions to improve the return rate for tuberculin skin test readings. The studies of default reminders were conducted in India (2) and Iraq (1) and focused on patients who had failed to collect their drugs.

## 1) Pre-appointment reminders for people on TB treatment

For people being treated for active TB, clinic attendance was higher (1 trial in the USA, low certainty of the evidence) and TB treatment completion was higher (1 trial in Thailand, low certainty of the evidence) in people receiving pre-appointment reminder phone-calls.

➡ **For patients being treated for active TB, pre-appointment reminders may increase clinic attendance and the number of patients completing treatment. The certainty of this evidence is low.**

## TB treatment: pre-appointment reminder versus no reminders

| People | People on TB treatment |
|---|---|
| **Settings** | Outpatient clinics |
| **Intervention** | Pre-appointment reminders |
| **Comparison** | No reminders |

| Outcomes | Absolute effect* | | Relative effect (95% CI) | Certainty of the evidence (GRADE) |
|---|---|---|---|---|
| | **Without pre-appointment reminders** | **With pre-appointment reminders** | | |
| **Attendance at single clinic appointment** | 50 per 100 | 66 per 100 | RR 1.32 (1.10 to 1.59) | ⊕⊕◯◯ Low |
| | **Difference: 16 more per 100 patients** (Margin of error: 5 to 30 more) | | | |
| **Completion of TB treatment** | 88 per 100 | 100 per 100 | RR 1.14 (1.02 to 1.27) | ⊕⊕◯◯ Low |
| | **Difference: 12 more per 100 patients** (Margin of error: 2 to 12 more) | | | |

Margin of error = Confidence interval (95% CI)   RR:  Risk ratio     GRADE: GRADE Working Group grades of evidence (see above and last page)
\* The attendance and completion rates WITHOUT the intervention are based on what was reported in the trials. The corresponding rates WITH the intervention (and the 95% confidence interval for the difference) is based on the overall relative effect (and its 95% confidence interval).

# 2) Default reminders for people on TB treatment

For people being treated for active TB, clinic attendance was higher (1 trial in India, low certainty of the evidence) and TB treatment completion was higher (2 trials, moderate certainty of the evidence) with default reminders (letters or home visits).

➜ **For patients being treated for active TB, default reminders probably increase the number of patients completing treatment (moderate certainty of the evidence) and may increase clinic attendance (low certainty of the evidence).**

| TB treatment: default reminders versus no reminders | | | | |
|---|---|---|---|---|
| **People**  People on TB treatment  **Settings**  Outpatient clinics  **Intervention**  Default reminders  **Comparison**  No reminders | | | | |
| Outcomes | Absolute effect* | | Relative effect (95% CI) | Certainty of the evidence (GRADE) |
| | **Without default reminders** | **With default reminders** | | |
| Attendance at single clinic appointment | 10  per 100 | 52  per \|00 | RR 5.04 (1.61 to 15.78) | ⊕⊕◯◯ Low |
| | **Difference: 42 more per 100 patients**  (Margin of error: 7 to 90 more) | | | |
| Completion of TB treatment | 78  per 100 | 91  per 100 | RR 1.17 (1.11 to 1.24) | ⊕⊕⊕◯ Moderate |
| | **Difference: 13 more per 100 patients**  (Margin of error: 9 to 19 more) | | | |
| Margin of error = Confidence interval (95% CI)    RR:  Risk ratio    GRADE: GRADE Working Group grades of evidence (see above and last page)  * The attendance and completion rates WITHOUT the intervention are based on what was reported in the trials. The corresponding rates WITH the intervention (and the 95% confidence interval for the difference) is based on the overall relative effect (and its 95% confidence interval). | | | | |

# 3) Pre-appointment reminders for people on TB prophylaxis

For people on TB prophylaxis, clinic attendance was higher with pre-appointment phone-calls (1 trial in the USA, low certainty of the evidence), and attendance at the final clinic was higher with regular three-monthly phone-calls or nurse visits (1 trial in Spain, low certainty of the evidence).

➜ **For people on TB prophylaxis, pre-appointment reminders may increase clinic attendance. The certainty of this evidence is low.**

| TB skin testing: pre-appointment reminders versus no reminders | | | | |
|---|---|---|---|---|
| **People** | People at risk of TB | | | |
| **Settings** | Outpatient clinics | | | |
| **Intervention** | Pre-appointment reminders | | | |
| **Comparison** | No reminders | | | |
| Outcomes | Absolute effect* | | Relative effect (95% CI) | Certainty of the evidence (GRADE) |
| | **Without pre-appointment reminders** | **With pre-appointment reminders** | | |
| **Attendance at clinic with pre-appointment phone calls** | 48 per 100 | 62 per 100 | RR 1.30 (1.07 to 1.59) | ⊕⊕◯◯ Low |
| | **Difference: 14 more per 100 patients** (Margin of error: 3 more to 28 more) | | | |
| **Attendance at final clinic with three monthly phone calls** | 65 per 100 | 94 per 100 | RR 1.44 (1.21 to 1.72) | ⊕⊕◯◯ Low |
| | **Difference: 29 more per 100 patients** (Margin of error: 14 more to 35 more) | | | |
| Margin of error = Confidence interval (95% CI)   RR: Risk ratio   GRADE: GRADE Working Group grades of evidence (see above and last page) <br> * The attendance rate WITHOUT the intervention is based on what was reported in the trials. The corresponding rate WITH the intervention (and the 95% confidence interval for the difference) is based on the overall relative effect (and its 95% confidence interval). | | | | |

# 4) Pre-appointment reminders for TB skin testing

For people undergoing screening for TB, there was little or no effect on the proportion of people returning to clinic for the result of their skin test with pre-appointment phone calls (3 trials in the USA, low certainty of the evidence) or take home reminder cards (2 trials in the USA, low certainty of the evidence).

➔ **For people undergoing screening for TB, pre-appointment reminders may have little or no effect on the number of people who return to clinic for the result of their skin test. The certainty of this evidence is low.**

| TB skin testing: pre-appointment reminders versus no reminders | | | | |
|---|---|---|---|---|
| **People** People at risk of TB<br>**Settings** Outpatient clinics<br>**Intervention** Pre-appointment reminders<br>**Comparison** No reminders | | | | |
| Outcomes | Absolute effect* | | Relative effect (95% CI) | Certainty of the evidence (GRADE) |
| | **Without pre-appointment reminders** | **With pre-appointment reminders** | | |
| **Attendance at clinic** | 60 per 100 | 63 per 100 | RR 1.06 (0.92 to 1.21) | ⊕⊕◯◯ Low |
| | **Difference: 3 more per 100 patients** (Margin of error: 5 fewer to 12 more) | | | |
| Margin of error = Confidence interval (95% CI)   RR: Risk ratio   GRADE: GRADE Working Group grades of evidence (see above and last page)<br>* The attendance rate WITHOUT the intervention is based on what was reported in the trials. The corresponding rate WITH the intervention (and the 95% confidence interval for the difference) is based on the overall relative effect (and its 95% confidence interval). | | | | |

# Relevance of the review for low-income countries

| ➔ Findings | ▷ Interpretation* |
|---|---|
| **APPLICABILITY** | |
| ➔ **All the included studies on pre-appointment reminders were conducted in high-income countries.**<br>➔ **All the included studies default reminders were conducted in low- and middle-income countries.** | ▷ *Default reminder systems that do not rely on home visits require a basic level of infrastructure (such as a postal service or phone service), which may not be available in all settings. However, the growing availability of mobile phones in low-income countries might allow mobile phone-based reminder systems to be used effectively.*<br>▷ *Barriers to access (e.g. transportation, fees, distance, competing commitments) are often more pronounced in low-income countries.*<br>▷ *The implementation of a reminder system requires appropriate staffing, which is often in short supply. In many low-income countries, lay or community health workers could deliver reminders.* |
| **EQUITY** | |
| ➔ **The review did not report the effects of reminder systems on equity.** | ▷ *Reminder systems that rely on home visits will rarely be able to cover populations beyond a certain distance away from the healthcare facility administering the service. Populations in remote areas tend to be poorer and more disadvantaged and may therefore face difficulties in keeping appointments and visiting clinics.*<br>▷ *Reminder systems rely on services (such as mail and phone systems) that may not be available. Populations without access to such services may therefore not be covered. Such populations tend to be poorer and more disadvantaged.* |
| **ECONOMIC CONSIDERATIONS** | |
| ➔ **The review did not report information on costs or cost-effectiveness.** | ▷ *Reminder systems incur financial costs (such as staff salaries, phone rentals and postal fees) and may place additional work burdens on already overstretched staff.*<br>▷ *Reducing the number of patients who do not complete treatment or do not adhere to scheduled appointments reduces resource waste (e.g. diagnostic tests, drugs, unproductive waiting time), reduces the risk of emerging (and costly) multi-drug resistance, and improves treatment outcomes, thus resulting in improved cost-effectiveness.* |
| **MONITORING & EVALUATION** | |
| ➔ **The certainty of the evidence for the effects of reminder systems is mostly low.** | ▷ *Due to the low certainty of the evidence, more well-designed trials are needed to establish whether pre-appointment reminders are effective in different settings, and the best way of delivering reminders, especially in low-income countries.*<br>▷ *For default reminders, well-designed trials are needed to determine the most effective reminder actions in different settings.*<br>▷ *The cost-effectiveness of reminder systems should be evaluated.* |

*Judgements made by the authors of this summary, not necessarily those of the review authors, based on the findings of the review and consultation with researchers and policymakers in low-income countries. For additional details about how these judgements were made see: www.supportsummaries.org/methods

# Additional information

## Related literature

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## Conflict of interest

None declared. For details, see: www.supportsummaries.org/coi

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## This review should be cited as

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