Patient-tailored reminders: an effective, pragmatic adherence intervention for primary care

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Background

• One in ten, or >2 million, Australians with asthma¹
• In asthma daily inhaled corticosteroids (ICS) are prescribed to achieve asthma control through prevention of symptoms & exacerbations
• Poor adherence with ICS is common:
  ▪ Only ~21% had ICS dispensed at level consistent regular use in Australia (2009)¹
  ▪ 26% mean ICS adherence in US managed care organisation (2010)²
• Poor adherence with ICS is associated with poor asthma outcomes (e.g., <QOL, >exacerbations, >mortality risk)²-⁴
  – 38,681 Australians hospitalized due to asthma in 2011-12¹
• Guidelines emphasise management of ICS adherence in primary care but practical/feasible tools for staff are lacking⁵

Background

• Poor ICS adherence in asthma can be intentional (e.g. patient’s beliefs about treatment/disease) or unintentional (e.g. forgetting)\(^1,2\)

• Two overarching interventions may improve adherence:
  
  o Empathic tailored communication intervention to address patients personal beliefs which are adherence barriers
    
    ▪ Odds good patient-adherence 1.62 times higher in patients of physicians trained in effective communication\(^3\)
    
    ▪ Brief motivational interviewing (MI) training for primary care health professionals improves patient adherence with medication\(^4\), smoking cessation\(^5\)

  o Smart reminder system to address forgetting
    
    ▪ Evidence for effectiveness of reminders and feedback exist in other diseases and medication formats e.g. pill box reminders\(^6\)
    
    ▪ Only published (6-month) asthma study suggests efficacy\(^7\); mean ICS adherence at weeks 13-24: Reminder:93% vs. Control:74% - select asthma sample*

*Clinical research setting; high control group ICS adherence; patients reimbursed $100;

MICA Aims and Methods

• Evaluate effectiveness of feasible GP-delivered ICS adherence interventions for primary care to improve adherence and asthma control

Study design and methods

• 2x2 factorial cluster parallel group RCT with 6 month follow up
• Individual GPs were randomised* to one of four intervention groups (next slide)
  – GPs enrolled/delivered intervention to ≤7 own asthma patients (GP cluster) with poor asthma control (Asthma Control Test ≤19) and prescribed an ICS/LABA inhaler for ≥1 month
  – GPs followed up each patient at a 2nd visit 28 days later/ASAP (mean day 57)
  – GPs $100 per patient reimbursement for study processes and attending study training
• Study staff collected data “hands off” by telephone/postal questionnaire every 2 months (primary outcome asthma control test; blinded staff)

Analysis

• By ITT, mixed models (GEE model for severe exacerbations†) adjusted for baseline, GP cluster, repeated measures

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*Defined by prednisone courses
†Defined by prednisone courses
*Randomisation stratified by GP practice location, COPD/asthma management training last 12 months, GP speaking 2nd non-English language
Four GP-delivered intervention groups: 2x2 factorial design

1. Active usual care (Medicare cycle of care)

2. Personalised Adherence Discussion (PAD)

3. Inhaler Reminders and adherence Feedback (IRF)

4. PAD+IRF
Beliefs: GP-led personalised adherence discussion (PAD) intervention

- PAD group GPs received 2 hours training in brief motivational interviewing communication skills and goal-setting plus ongoing telephone training/support

- GPs received PAD toolkit
  - 10-item questionnaire for identifying each patient’s adherence barrier/s
  - Topic-specific tools for tailoring discussions on adherence barriers

Forgetting: Inhaler Reminder and adherence Feedback (IRF) intervention

- Patients of reminder group GPs received reminders and adherence feedback via the “asthmatrack”/SmartTrack device clipped to ICS:
  - *Twice daily personalised inhaler reminders for missed doses*
  - *Patients could change reminder times/ringtone or cancel/stop reminders*
  - *Device provided adherence feedback to patients (dose last taken)*
  - *Upload to secure website: provided prospective graph daily ICS puffs taken, accessed by GPs/patients*
Results: Patient demographics and baseline characteristics

<table>
<thead>
<tr>
<th>Patients</th>
<th>UC (n=43)</th>
<th>PAD (n=24)</th>
<th>IRF (n=35)</th>
<th>IRF&amp;PAD (n=41)</th>
<th>All Groups (N=143)</th>
</tr>
</thead>
<tbody>
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UC=usual care; PAD=personalised adherence discussions; IRF=reminder/feedback

- 40 GPs enrolled 1 or more of the 143 patients; 3 GPs enrolled 0 patients
- High ICS doses at baseline in all groups; Fluticasone: 500µg maximum efficacy
- Diverse social and linguistic background
Results: Mean ICS adherence over 6 months, by intervention group

- Over 6M, adherence significantly higher in reminder/feedback (IRF and IRF+PAD) than non-reminder groups (UC and PAD; (p<0.0001)

- No difference between usual care and PAD group; no interactive effect of IRF+PAD

UC=usual care; PAD=personalised adherence discussions; IRF=reminder/feedback;
Adherence defined as: mean % prescribed dose used per day (capped at 100% daily); 113/143 patients included in the ITT adherence analysis
Results: Mean ICS adherence by study month and intervention group

By month, mean ICS adherence was consistently significantly higher in reminder than non-reminder groups throughout the study.

At 6 months adherence twice as high in reminder groups (60%±38 vs. 29%±33).

Usual care group adherence at 6 months consistent with national/international adherence rates in the general community (26.3%).

UC=usual care; PAD=personalised adherence discussions; IRF=reminder/feedback
Comparative trajectory
Mean adherence with ICS falls to 50% a week after hospital discharge

Ref: Krishnan J. Am J Respir Crit Care Med 2004; 1281–1285 [electronic monitoring: % prescribed daily dose]
Results: Mean asthma control test (ACT) score by study month and intervention group

- Asthma control improved in all interventions (overall mean change in ACT 4.5±4.9, \(p<0.0001\); MCID 3)
- No significant difference in asthma control between groups (\(p=0.14\))
- Improvement in asthma control in PAD groups continued between 2-6 months
- Fewer patients in reminder/feedback groups had exacerbations (requiring oral steroids) during the study, IRF:11% vs Non-IRF 28%, \(p=0.013^\dagger\)

\[95\%\text{ CI}^\dagger\]

\(^\dagger\) After adjusting for past exacerbations at baseline, \(p=0.0597\)

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Discussion

- In primary care, reminder/feedback produced significantly greater ICS adherence above active usual care (sustained 6M)

- Personalised adherence discussions: similar adherence to usual care
  - GPs responded well to communication training (usefulness rated 82/100 + interviews)
    - Longer study period needed?; Prioritization of longer training; Skills perhaps poorly maintained (GPs blinded at study entry)?

- Adherence and asthma control
  - Unclear association between improved adherence and asthma control
    - Asthma control improved in all groups; High BL ICS doses in all groups mask effect increased adherence (500µg max efficacy)?
  - Fewer patients in reminder/feedback groups had exacerbations during study
    - Poor adherence at high ICS doses maintains reasonable symptom control but leaves patients vulnerable to exacerbations
Conclusion

• In this first study in primary care, reminders and adherence feedback were demonstrated to be a highly effective, feasible, low GP burden adherence promotion tool for preventative asthma treatment.

• Further work needed in asthma to understand the complex relationship between prescribing, improved adherence and asthma outcomes.

• Implementation research into the effectiveness of reminders & communication training is recommended including in different health professionals, settings and countries.
  
  – Reminders/feedback may provide a feasible solution to improving ICS adherence, including in disadvantaged/CALD patients in Australia.
Acknowledgements

National Health and Medical Research Council, Australia who provided funding

The patients and GPs who participated in the study
Sydney area Divisions of General Practice which assisted with study advertising and GP recruitment

Co-authors:
Prof. Tim Usherwood Dr. Lorraine Smith, Prof. Susan M. Sawyer, Dr Wei Xuan, Prof Cynthia Rand, Prof. Helen K. Reddel

Research Assistants:
Pamela Kidd, Jade Jaffar, Marilyn Yee, Stephanie Cooper, Wafaa Nabil Ezz, Adriana Lince, Brock Patton & Francesca Tang
End
Results: GP and patient demographics and baseline characteristics

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<td>Years practicing as a GP, mean (range)</td>
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FIG 2. Flow of GPs and participants (intention-to-treat [ITT] population) through the study. The number of GPs in each intervention group who did not enroll a patient: UC = 0, PAD = 1, IRF = 1, IRF + PAD = 1.

*GPs withdrew before allocation revealed and study training received. †Number of patients excluded from ITT analysis (asthma control) because of dropout or lost to follow-up before the completion of 2 or more study questionnaires.