The electronic interface:
1) The changing face of medicine; where might electronic interventions help? *Martyn Partridge*
2) The acute physician and technology: the Australian experience. *Alasdair MacDonald*
3) How good are patient–orientated medical apps? *Kit Huckvale*
4) Solving sepsis with iPads. *Gary Davies*
The changing face of medicine: Where might electronic interventions help?

Martyn R Partridge
Professor of Respiratory Medicine
Imperial College London
National Heart and Lung Institute
Royal Brompton Campus
Mantra 1

• Good research involves delineating the correct research question
Mantra 2

- Good research involves delineating the correct research question
- To deliver optimal healthcare involves defining the health burden and then addressing any barriers that prevent its delivery
Mantra 2

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• To deliver optimal healthcare involves defining the health burden and then addressing any barriers that prevent its delivery
### Causes of Death

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Cause of Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridget A. Cosgrove</td>
<td>4 years 10 months</td>
<td>Diphtheria</td>
</tr>
<tr>
<td>John Graves</td>
<td>38 years</td>
<td>Abscess on kidney</td>
</tr>
<tr>
<td>Sarah McSkimming</td>
<td>2 months</td>
<td>Pneumonia</td>
</tr>
<tr>
<td>Peter Jespersen</td>
<td>20 years</td>
<td>Influenza</td>
</tr>
<tr>
<td>Eric Neil Neilson</td>
<td>3 years</td>
<td>Scarletina</td>
</tr>
<tr>
<td>Ten Tung</td>
<td>36 years</td>
<td>Drowned</td>
</tr>
<tr>
<td>Catherine Leyden</td>
<td>53 years</td>
<td>Child birth</td>
</tr>
<tr>
<td>Thomas Brydon</td>
<td>32 years</td>
<td>Mining Explosion</td>
</tr>
<tr>
<td>Alexander Cameron</td>
<td>32 years</td>
<td>Kicked by horse</td>
</tr>
</tbody>
</table>

Parish records 1875
WHAT DID PEOPLE GO TO HOSPITAL FOR?

Over a period of five months in 1866 the Grey Hospital admitted a total of 56 patients. They had the following illnesses:

- Typhoid fever - 11 patients
- Wounds - 9 patients
- Rheumatism - 9 patients
- Bilious fever - 4 patients
- Bronchitis - 3 patients
- Pneumonia - 2 patients
- Dementia - 2 patients
- Syphilis - 2 patients
- Concussion - 2 patients
- Fracture of arm - 2 patients
- Fracture of leg - 2 patients
- Fracture of collarbone - 1 patient
- Dysentery - 1 patient
- Cystitis - 1 patient
- Jaundice - 1 patient
- Acute angina - 1 patient
- Ophthalmia (conjunctivitis) - 1 patient
- Hepatitis - 1 patient
- Gangrene - 1 patient
Fast forwards to 2014

• Heart Disease
• Cerebrovascular Disease
• Diabetes
• Lung Disease
• Hypertension
• Obesity
Fast forwards to 2014

- Heart Disease
- Cerebrovascular Disease
- Diabetes
- Lung Disease
- Hypertension
- Obesity

» Plus pneumonia
The burden of ill health is changing; but at different rates in different countries.
Changes in the pattern and type of diseases may need different services and different qualities in doctors?

A series of acute illnesses (eg diarrhoeal illnesses, ARI,)

A long term disorder (eg depression, COPD, Asthma, Hypertension, Sleep apnoea syndromes, Diffuse Parenchymal Lung Disease, Diabetes)
Changes in the pattern and type of diseases may need different services and different qualities in doctors?

A series of acute illnesses (eg diarrhoeal illnesses, ARI,)

A long term disorder (eg depression, COPD, Asthma, Hypertension, Sleep apnoea syndromes, Diffuse Parenchymal Lung Disease, Diabetes)

It is not Infectious vs non infectious that is important
It is short term versus long term
Mantra 2

• Good research involves delineating the correct research question
• To deliver optimal healthcare involves defining the health burden and then addressing any barriers that prevent its delivery
Changes in the pattern and type of diseases may need different services and different qualities in doctors?

Long term disorders need more attention paid to
- Enhancing Compliance
- Information sharing (prior to Shared Decision Making and Motivational Interviewing)
- Supporting patients as they self manage their own condition
- Providing convenient follow up
- Ensuring Health Professionals can confidently address polymorbidity

A long term disorder (eg depression, COPD, Asthma, Hypertension, Sleep apnoea syndromes, Diffuse Parenchymal Lung Disease, Diabetes)
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A long term disorder (eg depression, COPD, Asthma, Hypertension, Sleep apnoea syndromes, Diffuse Parenchymal Lung Disease, Diabetes)
Adherence/Compliance/Concordance

A situation where an intervention / treatment is not used in the manner previously discussed between patient and health professional
Adherence/Compliance/Concordance

A situation where an intervention / treatment is not used in the manner previously discussed between patient and health professional

The size of the problem?
The Prevalence of Nonadherence in Difficult Asthma

Jacqueline Gamble¹,², Michael Stevenson³, Elizabeth McClean⁴, and Liam G. Heaney¹

¹Centre for Infection and Immunity, Queen’s University of Belfast; ²Regional Respiratory Centre, Belfast City Hospital; ³Department of Epidemiology and Public Health, Queen’s University of Belfast; and ⁴Department of Clinical Chemistry, Belfast City Hospital, Belfast, Northern Ireland

Rationale: With the advent of new and expensive therapies for severe refractory asthma, targeting the appropriate patients is important. An important issue is identifying nonadherence with current therapies. The extent of nonadherence in a population with difficult asthma has not been previously reported.

Objectives: To examine the prevalence of nonadherence to corticosteroid medication in a population with difficult asthma referred to the Regional Respiratory Centre, Belfast City Hospital.

Method: As a percentage. Blood plasma prednisolone and cortisol assay levels were used to examine the utility of these measures in assessing adherence to oral prednisolone. Patient demographics, hospital admissions, lung function, oral prednisolone courses, and quality of life data were analyzed to identify the variables associated with reduced medication adherence.

Measurements and Main Results: A total of 182 patients were assessed. Sixty-three patients (35%) filled 50% or fewer of the prescribed medication prescriptions; 88% admitted poor adherence with inhaled therapy after initial denial. Twenty-one percent of patients filled more than 100% of the prescriptions, and 45% of subjects filled between 51 and 100% of prescriptions. Twenty-three of 51 patients (45%) prescribed oral corticosteroids were found to be nonadherent.

Conclusions: A significant proportion of patients with difficult-to-control asthma are nonadherent to oral corticosteroid therapy. Nonadherence with medication in subjects with different severities of asthma, including subjects with mild and moderate asthma, is currently under investigation.

- 45% of patients prescribed oral steroids were non adherent
- 88% admitted to poor adherence with inhaled therapy after initial denial
The majority of patients with difficult to control asthma are non-adherent to their asthma medication.
In a post hoc analysis of the TORCH study, 20.2% of COPD patients had deficient adherence and 79.8% had good adherence (>80% use of study medication from dose-counters).

Of these compliers, 11.3% died compared with 26.4% of the 1232 patients (20.2%) with poor adherence.

Annual rates of hospitalisation for exacerbations were 0.15 and 0.27 respectively.

There was a significant association between adherence and mortality after adjusting for other factors related to prognosis, HR=0.40 (0.35-0.46), p <0.001.
Between a third and a half of all medicines prescribed for long term conditions are not taken as recommended.
Therapy not being taken

Can reflect:
• Forgetfulness
• Misunderstanding
• Fear of side effects, real or imagined
• A feeling of not being in control, or not being involved in decision making
• Sub optimal doctor patient communication
Therapy not being taken

Can reflect:

• Forgetfulness
• Misunderstanding
• Fear of side effects, real or imagined
• A feeling of not being in control, or not being involved in decision making
• Sub optimal doctor patient communication
Compliance and Doctor-Patient Communication

Adherence

\[
\begin{array}{c|c}
\text{<70\%} & \text{>70\%} \\
\end{array}
\]

Communication Score:

\[
\begin{array}{c|c}
23+/-5 & 27+/-3 \\
\text{(Range 6-30)} & \text{(p>0.001)} \\
\end{array}
\]

(Am J Respir Crit Care Med 1998;157:1810-17)
Therapy not being taken

Can reflect:

• Forgetfulness
• Misunderstanding
• Fear of side effects, real or imagined
• A feeling of not being in control, or not being involved in decision making
• Sub optimal doctor patient communication
Pill organisers
A daily SMS reminder increases adherence to asthma treatment: A three-month follow-up study

Ulla Strandbygaard, Simon Francis Thomsen*, Vibeke Backer

Department of Respiratory Medicine, Bispebjerg Hospital, Bispebjerg Bakke 23, DK-2400 Copenhagen, Denmark

Received 30 April 2009; accepted 24 July 2009

Compliance; follow-up studi

30% of those with asthma blame forgetfulness for non-compliance, SMS reminders have been shown to improve use of inhalers
Figure 1 Change in mean adherence rate in the SMS group and the control group between week 4 and week 12.

Ulla Strandbygaard, Simon Francis Thomsen, Vibeke Backer
Respiratory Medicine, Volume 104, Issue 2, 2010, 166 - 171
Numerous free reminder apps available to download
Changes in the pattern and type of diseases may need different services and different qualities in doctors?

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A long term disorder (e.g. depression, COPD, Asthma, Hypertension, Sleep apnoea syndromes, Diffuse Parenchymal Lung Disease, Diabetes...
How might technology help with information sharing?

80% of internet users look online for health information

Geonectric prediction
4.8 BILLION people own a mobile phone

4.2 BILLION people own a toothbrush

Geonectric prediction
By 2014 estimated that overall internet consumption on mobile devices will exceed that of traditional computers.

Geonectric prediction
Figure 5. Sources accessed by respondents to seek additional information about their condition

For Asthma:
- GP/Specialist: 57.6%
- Nurse: 7.5%
- Pharmacist: 22%
- Spec. magazines: 24.8%
- TV/radio: 18.6%
- Pts’ association: 9.6%
- Spec. websites: 65.4%
- Internet (general): 13.9%
- Others: 4.6%

For COPD:
- GP/Specialist: 62.1%
- Nurse: 13.1%
- Pharmacist: 17.3%
- Spec. magazines: 26.3%
- TV/radio: 21.8%
- Pts’ association: 9.8%
- Spec. websites: 50.5%
- Internet (general): 11.6%
- Others: 4.9%

Partridge et al PCRJ
2011 20(3)
315-323
Information provided to those with Asthma by a GP

N=1022    Partridge et al  Primary Care Respiratory Journal 2011
Useful Web Addresses

General Information on Lung Diseases

The following websites contain information about many different lung conditions and are an excellent place to start if you are looking for more information about your condition or about a procedure that you are going to have.

1. The British Lung Foundation - www.lunguk.org
   This UK Charity has an excellent website that provides useful information about almost every lung condition, and offers support to those with lung disease and their carers.

2. NHS Direct Online - www.nhsdirect.nhs.co.uk
   A comprehensive website with information on many aspects of health, including a health encyclopaedia, best treatment guide and self-help guide.

3. BBC Health Online - www.bbc.co.uk/health
   This website provides well-presented information on a wide range of lung disorders, and on other health-related topics.

4. Patient UK - www.patient.co.uk
   This very useful website provides comprehensive leaflets on a wide range of lung conditions, treatments and procedures. Also provides a list of useful patient groups & organisations.

5. The Department of Health - www.doh.gov.uk
   This government website provides health and social care policy, guidance and publications.

   This website provides information on how to obtain MedicAlert bracelets.

7. Specific Lung Diseases

The following websites are dedicated to specific lung diseases. These sites offer information and support to people with the disease, and many have information on current research into the conditions. You will also find useful information about these conditions on the websites listed on the opposite page.

1. Asthma
   - Asthma UK - www.asthma.org.uk
   - Allergy UK - www.allergyuk.org
   - Health and Safety Executive - www.hse.gov.uk/asthma

2. Chronic Obstructive Pulmonary Disease
   - COPD International - www.copdinternational.com

3. Cystic Fibrosis
   - The Cystic Fibrosis Trust UK - www.cftrust.org.uk
   - The UK CF Gene Therapy Consortium - www.cffgenetherapy.org.uk

4. Lung Cancer
   - Cancer Research UK - www.cancerresearchuk.org
   - CancerBACUP - www.cancerbacup.org.uk
   - Roy Castle Lung Cancer Foundation - www.roycastle.org

5. Sleep Apnoea
   - The British Snoring and Sleep Apnoea Association - www.britishsnoring.co.uk
   - The Sleep Apnoea Trust - www.sleep-apnoea-trust.org
   - The Sleep Council - www.sleepcouncil.com
Changes in the pattern and type of diseases may need different services and different qualities in doctors?

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A long term disorder (eg depression, COPD, Asthma, Hypertension, Sleep apnoea syndromes, Diffuse Parenchymal Lung Disease, Diabetes)
On average how often do those with Asthma go to see the GP and how long are the consultations?

<table>
<thead>
<tr>
<th>Go to the GP</th>
<th>Frequency of visit</th>
<th>Average length of the visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>82,6%</td>
<td>13.4 months</td>
<td>12 minutes</td>
</tr>
</tbody>
</table>

Partridge et al/ PCRJ 2011
Each year for 364 days, 23 hours and 49 minutes the person with asthma looks after their own condition by themselves......
Each year for 364 days, 23 hours and 49 minutes the person with asthma looks after their own condition by themselves……

But whether in the absence of advice they do so optimally is of course another matter
“As far as possible patients should be trained to manage their own treatment rather than be required to consult their doctor before making changes.”
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>All patients should be offered self-management education, including written individualised asthma action plans</td>
</tr>
<tr>
<td>B</td>
<td>Introduce asthma action plans as part of a structured educational discussion</td>
</tr>
</tbody>
</table>
Prevalence of asthma and asthma action plans in South Australia: population surveys from 1990 to 2001

David H Wilson, Robert J Adams, Sarah L Appleton, Graeme Hugg, David Wilkinson, Janet Hiller, Philip Ryan, Juliane Cheek and Richard E Ruffin

ABSTRACT


Design, setting and participants: Surveys by telephone interview of the South Australian population between 1990 and 2001, and interview of participants in their own homes by trained health interviewers.

Main outcome measures: Asthma prevalence, percentage of patients with written action plans, and asthma associated morbidity.

Results: The reported prevalence of doctor-diagnosed asthma remained stable at 8% (95% CI, 0.4%–6.6%) in 1990 to 12.5% (95% CI, 0.4%–6.6%) in 1998 and 12.9% (95% CI, 0.4%–6.6%) in 2001. Mortality, as measured by waiting at medical centre for normal activities because of asthma, reduced from 8% (95% CI, 0.4%–6.6%) in 1990 to 0% (95% CI, 0.4%–6.6%) in 2001. The uptake of action plans has remained stable over time. The associated decline in hospital admissions in recent years is cause for concern.

MJA 2003; 178: 483–485

METHODS

The data for this survey were collected in the South Australian Health Omnibus Survey (SAHOS) between 1990 and 2001. The SAHOS methods are documented in detail elsewhere.

For editorial comment, see page 427

University of Adelaide, Adelaide, SA.

David H Wilson, PhD, Associate Professor, Department of Medicine, Robert J Adams, MD, Consultant, Department of Medicine, Sarah L Appleton, BSc, Research Officer, Department of Nutrition, Graeme Hugg, PhD, Honorary, Department of Geography, Janet Hiller, PhD, Honorary, Department of Public Health, Philip Ryan, MD, Associate Professor, Department of Public Health, Richard E Ruffin, MD, Professor, Department of Medicine.

University of South Australia, Adelaide, SA.

22% of adults had received Action plans
Do practices comply with key recommendations of the British Asthma Guideline? If not, why not?

*Sharon Wiener-Ogilvie*, Hilary Pinnock, Guro Huby, Aziz Sheikh, Martyn R Partridge, John Gillies

Only 23% of patients had asthma action plans
Only 23% of those who died had an action plan
Barriers to implementation of guidelines in general were:

- Doubt about evidence base and relevance to primary care,
- Lack of knowledge, skills and misconceptions,
- Practical issues (Time, resources)
- Poor teamwork

Only 23% of patients had asthma action plans
Barriers to implementation of guidelines in general were:

Doubt about evidence base and relevance to primary care,

Lack of knowledge, skills and misconceptions,

Practical issues (Time, resources)

Poor teamwork

Only 23% of patients had asthma action plans

- Did not know what to do
- Thought it would take time
- Could not find the paper template
Can new technology help?
CHARING CROSS HOSPITAL PICTORIAL ASTHMA ACTION PLAN

Imperial College
London

Software by School of Informatics, University of Manchester

Is the patient an adult, aged over 18? Does the patient wish to receive advice as to how to alter treatment themselves?

Asthma Action Plan copyright Imperial College, 2006
Software copyright University of Manchester, 2005
Photographs of inhaler devices reproduced with the kind permission of the Chief Editor of MINS
Version 1.7.0, October 2006

No (Exit)  Yes (Proceed)
Inhalers

Inhaled Corticosteroids
- Beclomethasone (pMDI)
- Beclomethasone (QVAR - pMDI)
- Beclomethasone (QVAR - autohaler)
- Beclomethasone (QVAR - EASI-BREATHE)
- Budesonide (pMDI)
- Budesonide (turbohaler)
- Ciclesonide (pMDI)
- Fluticasone (pMDI)
- Fluticasone (Accuhaler)
- Mometasone (twisthaler)

Combination (ICS + LABA)
- Seretide (pMDI)
- Seretide (Accuhaler)
- Symbicort (Turbohaler)

Spacer Used?
- Yes

Dose
- 50 micrograms
- 100 micrograms
- 200 micrograms
- 250 micrograms

Number of Puffs: 0
Times Per Day: 0

Warning! Remember these plans are for use in adults only.

Picture of Selection

Preventive Inhaler | Additional Inhaler | Tablets Used | Reliever Inhaler
Continue
Additional Inhalers
- Salmeterol (pMDI)
- Salmeterol (Accuhaler)
- Formoterol (turbohaler)

Dose
- 25 micrograms

Number of Puffs: 0
Times Per Day: 0

Picture of Selection

Spacer Used?
- Yes

No Additional Inhaler
- Check if no additional inhaler

Preventive Inhaler _____ Additional Inhaler _____ Tablets Used _____ Reliever Inhaler _____

Continue
- **Montelukast**
  - 10 mg at bedtime

- **Uniphyllin**
  - 200 micrograms
  - 400 micrograms

- **Prednisolone**
  - Total dose in milligrams taken in one day
  - Prednisolone is usually best taken in one daily dose in the morning.
  - Very occasionally, patients will be maintained on an alternate day dosing regimen.
Best Peak Flow Reading in the Last Year

You may change the value by changing the text in the text box, using the up and down buttons or by moving the slider on the picture of the peak flow meter.

300

Continue
If you are feeling well and your peak flow reading is above 250 you should take:

- **Above 250**
  - 2 puffs of your Beclomethasone inhaler twice per day
  - 2 doses of your Salmeterol inhaler twice per day

**As Required Therapy**

Take your blue, reliever inhaler (Salbutamol) for unexpected coughing, wheezing or breathlessness
If you are woken at night by coughing, chest tightness or breathlessness or you need your blue reliever inhaler often or your peak flow reading has fallen to between 210 and 250, you should increase your routine therapy to

4 puffs of your Beclomethasone inhaler 4 times a day

Change Dose
Change to Twice a day

2 doses of your Salmeterol inhaler twice per day

When you feel better and your peak flow has returned to above 250 and remained there for at least 48 hours you can return to your normal maintenance therapy

The aim is to increase the dosage of inhaled steroid two, three or four fold according to the starting dose toward a maximum of 2000 micrograms of Beclomethasone equivalent per day. When asthma is unstable a four times daily dose regimen is preferable but if doubts about the patient’s ability to take medicines four times a day the the same dosage should be taken and split twice daily.

Continue to Zone 3
If you are becoming increasingly breathless and having to use your blue reliever inhaler every 4 to 6 hours or more often or your peak flow is between 150 and 210, you should take:

- 4 puffs of your Beclomethasone inhaler 4 times a day
- 2 doses of your Salmeterol inhaler twice per day

Between 150 and 210

6 Prednisolone tablets (5mg strength) immediately and every morning until your symptoms are better and your peak flow is above 250 for two days, then take 3 tablets every morning for the same number of days that it took you to get better and then stop the tablets. Let your doctor or nurse know within 24 to 36 hours that you have started such a course of tablets.
It is a medical emergency if your symptoms continue to get worse and your peak flow readings have fallen below 150. The action to take is:

Get help immediately by telephoning your doctor or calling for an ambulance by dialling 999 or 911. You should take 8 Prednisolone (steroid) tablets immediately (5 mg strength)

Under these circumstances it’s fine to use your reliever inhaler every 5 to 10 minutes until you receive medical assistance
CHARING CROSS HOSPITAL PICTORIAL ASTHMA ACTION PLAN

John Smith

Zone 1

- Above 440
- As Required

If you are feeling well and your peak flow reading is above 440, you should take:
1 dose of your Symbicort inhaler twice per day
1 microgram of Montelukast tablets once per day
Take your blue reliever inhaler (Salbutamol) for unexpected coughing, wheezing or breathlessness.

Zone 2

- Between 360 and 440

If you are woken at night by coughing, chest tightness or breathlessness, or you need your blue reliever inhaler often or your peak flow reading has fallen to between 360 and 440, you should increase your routine therapy to:
2 doses of your Symbicort inhaler 4 times per day
When you feel better and your peak flow has returned to above 440 and remained there for at least 48 hours, you can return to your normal maintenance therapy.

Zone 3

- Between 290 and 360

If you are becoming increasingly breathless and having to use your blue reliever inhaler every 4 to 6 hours or more often or your peak flow is between 290 and 360, you should take 8 Prednisolone tablets (5 mg strength) immediately and every morning until your symptoms are better and your peak flow is above 440 for two days, then take 3 tablets every morning for the same number of days that it took you to get better and then stop the tablets.
Let your doctor or nurse know within 24 to 38 hours that you have started such a course of tablets. Also, take 2 doses of your Symbicort inhaler 4 times per day.

Zone 4

- Below 290

If it is a medical emergency if your symptoms continue to get worse and your peak flow readings have fallen below 290.
Get help immediately by telephoning your doctor or calling for an ambulance by dialing 999 or 911.
You should take 8 Prednisolone (steroid) tablets immediately (5 mg strength)
Under these circumstances it's fine to use your reliever inhaler every 5 to 10 minutes until you receive medical assistance.

- Below 280

ASTHMA BUDDY PHONE APPS

Make your paper asthma action plan interactive with Asthma Buddy, our smartphone app for asthma
Zone 1 - Everyday: if you are feeling well, take

- **Indacaterol (Breezhaler)**
  - 300 micrograms
  - 1 dose in the morning

- **Tiotropium (Handihaler)**
  - 18 micrograms
  - 1 dose in the morning
  - NOTE: Take two inhalations of each capsule to receive the whole dose.

- **Beclometasone (pMDI)**
  - 100 micrograms
  - 2 puffs in the morning and night

- **Carbocisteine (Tablets)**
  - 375 milligrams capsule
  - 1 tablet 3 times per day

**As Required Therapy**

- **Salbutamol (pMDI)**
  - Take your reliever inhaler for unexpected coughing, chest tightness, wheezing or breathlessness.
Zone 2 - Unwell

If your sputum (phlegm) increases in quantity or changes colour (especially becoming green) you should start and complete your reserve supply of antibiotics.

If you are becoming increasingly short of breath you should take extra doses of your reliever inhaler.

Amoxycillin: take one tablet 3 times per day for 7 days.

If, despite this, you continue to feel much more breathless than usual you should start a course of steroid tablets.

Take 6 Prednisolone tablets (5mg strength) immediately and every morning for a total of 7 days, then stop the tablets. Sometimes it is necessary to continue on a longer course of Prednisolone and reduce it slowly; if this applies in your case your doctor or nurse will explain this to you.

Let your doctor or nurse know within 24 to 36 hours that you have started such a course of tablets and they will advise whether to take them for 7 days or longer.
If you are still feeling breathless and/or have swollen ankles,

Get help immediately by calling your doctor or dialing 999 and asking for an ambulance.
Effects of written action plan adherence on COPD exacerbation recovery

Erik W M A Bischoff, Dina H Hamid, Maria Sedano, Andrea Benedetti, Tjard R J Schermer, Sarah Bernard, François Maltais, Jean Bourbeau

ABSTRACT

Background: The effects of written action plans on recovery from exacerbations of chronic obstructive pulmonary disease (COPD) have not been well studied. The aim of this study was to assess the effects of adherence to a written action plan on exacerbation recovery time and unscheduled healthcare utilisation and to explore factors associated with action plan adherence.

Methods: This was a 1-year prospective cohort study embedded in a randomised controlled trial. Exacerbation data were recorded for 262 patients with COPD who received a written action plan for prompt treatment of exacerbations with the instructions to initiate standing prescriptions for both antibiotics and prednisolone within 3 days of exacerbation onset. Following the instructions was defined as adherence to the action plan.

Results: From the 268 exacerbations reported by 143 patients, start dates of antibiotics or prednisolone were provided in 217 exacerbations reported by 119 patients (63.8% male, mean age 66.4 years, post-bronchodilator forced expiratory volume in 1 s 0.91L (43.9% predicted)). In 40.1% of exacerbations, patients adhered to their written action plan. Adherence reduced exacerbation recovery time with statistical (p = 0.0001) and clinical (~5.9 days) significance, but did not affect unscheduled healthcare utilisation (HR 0.94, 95% CI 0.89 to 1.03). Factors associated with increased likelihood of adherence were influenza vaccination, cardiac comorbidity, younger age and lower FEV1, as percentage predicted.

Conclusions: This study shows that adherence to a written action plan is associated with a reduction in exacerbation recovery time by prompt treatment. Knowing the factors that are associated with proper and prompt utilisation of an action plan permits healthcare professionals to better focus their self-management support on appropriate patients.

Adherence to an action plan and (thus) prompt treatment shortens length of exacerbation

In the present study the primary aim was to assess the effects of adherence to a written action plan for prompt treatment of exacerbations with standing prescriptions for antibiotics and prednisolone on exacerbation recovery time and unscheduled healthcare utilisation. As a secondary objective, patient and disease characteristics that are associated with an enhancement of written action plan adherence were explored.
New Versions now downloadable free from my Imperial PWP
Changes in the pattern and type of diseases may need different services and different qualities in doctors?

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- Ensuring Health Professionals can confidently address polymorbidity

A long term disorder (e.g., depression, COPD, Asthma, Hypertension, Sleep apnoea syndromes, Diffuse Parenchymal Lung Disease, Diabetes)
Do patients attend planned consultations?

Respiratory Medicine UK data

- 15% did not attend their first appointment
- 13.8% did not attend follow up appointment
The effect of telephone reminders on attendance in respiratory outpatient clinics

Nicola Roberts, Karen Meade, Martyn Partridge

NHLS Division, Imperial College London, Respiratory Health Services Research Group, Charing Cross Hospital, London; Respiratory Medicine, Charing Cross Hospital, London, UK

Introduction: Patient non-attendance is an area of concern for all health care providers. A randomized controlled trial was undertaken to investigate whether reminder telephone calls improved attendance at respiratory outpatient clinics in the English National Health Service (NHS).

Methods: Patients were randomly allocated into one of two groups: either reminder telephone group or usual care. The telephone reminder group received telephone calls during the week prior to their appointment, either at home or at work. Patients in the usual care group received their appointment reminders in the post. The telephone group comprised 246 patients, who were contacted on average 2.7 times. The control group comprised 246 patients who were contacted on average 2.7 times. The telephone group was estimated to have 15% more patients who could be contacted about the appointment, compared with the control group. The cost of telephoning 200 patients could be offset against the cost of non-attendance.

Results: Routine telephoning of outpatients should become standard practice if reducing non-attendance is thought to be desirable, but general practitioner (GP) referral letters and hospital records of current hospital outpatients need to include an up-to-date telephone number. Consideration should be given to ‘out-of-hours’ reminder calls to maximize the contact rate.

Conclusion: Routine telephoning of outpatients should become standard practice if reducing non-attendance is thought to be desirable, but general practitioner (GP) referral letters and hospital records of current hospital outpatients need to include an up-to-date telephone number. Consideration should be given to ‘out-of-hours’ reminder calls to maximize the contact rate.

The effect of telephone reminders on attendance in respiratory outpatient clinics

But 58% of patients allocated to the telephone reminder group were not contactable (unanswered land lines, wrong number etc)

15% improvement in attendance rates by telephoning the patient to remind them about the appointment
Research article

Effectiveness of mobile-phone short message service (SMS) reminders for ophthalmology outpatient appointments: Observational study

Elizabeth Koshy*, Josip Car and Azeem Majeed

Address: Department of Primary Care and Social Medicine, Imperial College London, London, UK
Email: Elizabeth Koshy* - e.koshy@imperial.ac.uk; Josip Car - j.car@imperial.ac.uk; Azeem Majeed - a.majeed@imperial.ac.uk
* Corresponding author

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38% reduction in fail to attend rates
Use of telephone and SMS reminders to improve attendance at hospital appointments: a systematic review

Per E Hasvold and Richard Wootton
Norwegian Centre for Integrated Care and Telemedicine, University Hospital of North Norway, Tromso, Norway

Summary
Patients failing to attend hospital appointments contribute to inefficient use of resources. We conducted a systematic review of studies providing a reminder to patients by phone, short message service (SMS) or automated phone calls. A PubMed search was conducted to identify articles published after 1999, describing studies of non-attendance at hospital appointments. In addition, we searched the references in the included papers. In total, 29 studies were included in the review. Four had two intervention arms which were treated as independent studies, giving a total of 33 estimates. The papers were analysed by two observers independently. A study quality score was developed and used. Weighted means of the absolute and the relative change in non-attendance rates were calculated. The benefit from using other SMS, automated phone calls or telephone calls was 34% reduction on baseline non attendance rate.
Can we improve the patient experience when they come to see us?
Understanding reasons for asthma outpatient (non)-attendance and exploring the role of telephone and e-consulting in facilitating access to care: exploratory qualitative study

J D van Boar, H Joosten, J Carr, G K Freeman, M R Partridge, C van Weel, A Sheikh

Objective: To understand factors influencing patients’ decisions to attend for outpatient follow-up consultations for asthma and to explore patients’ attitudes to telephone and email consultations in facilitating access to asthma care.

Design: Exploratory qualitative study using in-depth interviews.

Setting: Hospital outpatient clinic in West London.

Participants: Nineteen patients with moderate to severe asthma (12 “attenders” and 7 “non-attenders”).

Results: Patients’ main reasons for attending were the wish to improve control over asthma symptoms and a concern not to jeopardise the valued relationship with their doctor. Anxiety, helplessness, poor health, and disillusionment with the structure of outpatient care were important factors implicated in non-attendance. The patients were generally critical of the suggestion that greater opportunity for telephone consulting might improve access to care. They expressed concerns about the difficulties in effectively communicating through non-face-to-face media and were worried that decisions would not be in a position to perform an adequate physical examination over the telephone. Email and text messaging were viewed as potentially useful for sending appointment reminders and sharing clinical information but were not considered to be acceptable alternatives to the face-to-face clinical encounter.

Conclusions: Anxiety, helplessness due to poor health, and frustration with outpatient clinic organisation resulting in long waiting times and discontinuity of care are factors that deter patients from attending for hospital asthma assessments. The idea of telephone review assessments was viewed with scepticism by most study subjects. Particular attention should be given to exploring how patients’ benefits of telephone consultations, and to seeking their views as to whether they would like to try them out before replacing face-to-face consultations with them. Email and text messaging may have a role in issuing reminders about imminent appointments.

Asthma affects over five million people in the UK, high-impact disease, and self-management is a cornerstone of quality care and has, when coupled with self-referenced data, been shown to be effective in reducing asthma morbidity. UK data, however, reveal that over one third of asthma patients do not record their hospital outpatient appointments, with comparable non-attendance rates in other specialties.** Despite such high rates and the associated costs to the National Health Service (current estimates are £401 million per year), we know surprisingly little about why patients do not attend for scheduled outpatient follow-up visits. There is a need to progress beyond simple blaming those who do not attend to think creatively about how access to care can be improved.

The experiences of primary care can offer some useful insights. Here the situation is even worse with up to two thirds of patients with asthma not attending for their annual assessment, perhaps because patients believe that their asthma is stable or that the relative inconvenience of attending outweighs the possible advantages of an asthma review.** Building on this understanding, it has been possible to achieve significant reductions in non-attendance rates—without compromising quality of care—by offering convenient telephone based asthma reviews, as shown in a recent primary care trial.* Whether such an option would be acceptable to patients seen in a hospital setting, whose asthma is potentially more severe, is unclear. The question is highly relevant with current policy initiatives aiming to improve attendance primarily by increasing patients’ choice of hospital and hence appointments.

We sought to explore patients’ reasons for attendance and non-attendance for asthma review appointments to determine the main factors that influenced their decision making. In view of a possible broader role for information technology innovations in facilitating care, we also investigated patients’ views on the roles of telephone and email consulting in facilitating asthma care.*

METHODS

Patients

The study sample comprised 50 patients with moderate to severe asthma (British Thoracic Society asthma guideline 1997) from the outpatient asthma clinic of a West London teaching hospital. They had either attended all follow-up appointments in the previous 6 months (“attenders”) or had missed one or two follow-up consultations during this period (“non-attenders”). In the 6 months preceding the study the non-attendance rate for asthma outpatients in the clinic was 29%.

Through purposive sampling we aimed to recruit participants with a range of age, sex, and ethnic backgrounds. We stipulated that included patients must have had at least two
The third commonest reason for non attendance was “Kept waiting last time”
Compliance related to time waiting to see the doctor

• Waited < 30 minutes: Compliance = 67%
• Waited 31 - 59 minutes: Compliance = 48%
• Waited an hour or more: Compliance = 31%

Geersten et al  J Chron Dis 1973 26: 689-698
More flexible and realistic clinic templates
One third of patients attending a busy respiratory clinic were suitable to have their next consultation by telephone rather than face to face

Roberts NJ and Partridge MR Resp Med 2007
<table>
<thead>
<tr>
<th></th>
<th>Telephone consultations</th>
<th>Face-to-face consultations</th>
<th>Patient satisfaction</th>
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</thead>
<tbody>
<tr>
<td>Time travelling to</td>
<td>0</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>hospital (mins)</td>
<td></td>
<td></td>
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<tr>
<td>Punctuality</td>
<td>28.3% started on time</td>
<td>35 mins</td>
<td></td>
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<tr>
<td>telephone</td>
<td>71.7% late – 9 mins</td>
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<tr>
<td>consultations</td>
<td>(mean)</td>
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<tr>
<td>Mean length of</td>
<td>= 9</td>
<td>15</td>
<td>114.3±14</td>
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<td>telephone</td>
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<tr>
<td>Consultation (min)</td>
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<tr>
<td>Where did they</td>
<td>WORK 23.9%</td>
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<tr>
<td>have their</td>
<td>HOME 73.3%</td>
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<tr>
<td>telephone</td>
<td>HOSPITAL 0%</td>
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<tr>
<td>consultation?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Patient</td>
<td>116.8 ± 15</td>
<td></td>
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<td>satisfaction</td>
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Preclinic telephone consultations: an observational cohort study

L O’Byrne, NJ Roberts and MR Partridge

ABSTRACT – Patients referred to secondary care for specialist respiratory review frequently undergo multiple hospital attendances for investigations and consultations. This study evaluated the potential of a preclinical telephone consultation and subsequent coordination of tests and face-to-face consultations to reduce hospital visits. Total hospital attendances were recorded for three cohorts (participants, non-participants and comparators) for 6 months from first specialist contact. Patients completed the medical interview satisfaction scale-21 (MISS-21). The study showed that a preclinical telephone consultation can significantly reduce hospital visits over a fixed period without reducing patient satisfaction. In total, 20.8% of the participant group had three or more hospital attendances compared with 42.9% of the non-participant group (p=0.001) and 44.7% of the comparator group (p=0.002). Participants had fewer follow up visits and lower rates of non-attendance/date rearrangement of appointments. This service reduces unnecessary hospital visits, seems to improve patient compliance and may save costs associated with non-attendance and follow up consultations.

KEY WORDS: consultations, respiratory, telephone

Telephone consultations have been used extensively in primary care and increasingly for review in secondary care, but using the telephone to obtain the initial clinical history represents a new use. An observational cohort study was designed to evaluate the effect of a preclinical telephone consultation on hospital attendances for new patients referred to a respiratory outpatient clinic. The aims were to reduce the number of attendances patients require and to enhance patient satisfaction.

Methods

The study was undertaken in a respiratory outpatient department based in a central London NHS teaching hospital and involved a convenience sample of 100 consecutive new referrals addressed to one named respiratory physician or generic 'Dear doctor' referrals. Ethics approval was obtained from the East London and City Ethics Committee 3 (REC: 07/Q0605/19). Postal invitations for the preclinic telephone consultations were sent to patients, with background information about the purpose of the call. For each telephone consultation, the respiratory consultant contacted the patient at a fixed time, took a history and discussed possible diagnoses and necessary investigations with the patient. The list of diagnostic tests was then given to the
Preclinic telephone consultations: an observational cohort study

L O’Byrne, NJ Roberts and MR Partridge

ABSTRACT – Patients referred to secondary care for specialist respiratory review frequently undergo multiple hospital attendances for investigations and consultations. This study evaluated the potential of a preclinic telephone consultation to facilitate secondary care and improve follow-up coordination.

Background
In a previous study, showed that:

1) The referral letter rarely permitted you to decide what investigations were needed
2) Clinical examination rarely altered the investigations you thought were necessary after taking the history

Telephone consultations have been used extensively in primary care and increasingly in secondary care. However, issues of confidentiality and the need to complete generic ‘Dear Doctor’ letters has led to postal invitations for telephonic consultations.

Postal invitations for the preclinic telephone consultations were sent to over 1500 patients, with background information about the purpose of the call. For each telephone consultation, the respiratory consultant contacted the patient at a fixed time, took a history and discussed possible diagnoses and necessary investigations with the patient. The list of diagnostic tests was then given to the...
Preclinic telephone consultations: an observational cohort study

L O’Byrne, NJ Roberts and MR Partridge

ABSTRACT – Patients referred to secondary care for specialist respiratory review frequently undergo multiple hospital attendances for investigations and consultations. This study evaluated the potential of a preclinic telephone consultation and its impact on hospital attendances, compliance with appointments and costs associated with non-attendance and follow up consultations. Telephone consultations have been used extensively in primary care and increasingly for review in secondary care, but using the telephone to obtain the initial clinical history represents a new use. An observational cohort study was designed to:

More than 3 Hospital attendances:
20.8% Intervention Group
42.9% Non Intervention Group
44.7% Alternate Comparator Group

KEY WORDS: consultations, respiratory, telephone
Changes in the pattern and type of diseases may need different services and different qualities in doctors?

Long term disorders need more attention paid to

- Enhancing Compliance
- Information sharing (prior to Shared Decision Making and Motivational Interviewing)
- Supporting patients as they self manage their own condition
- Providing convenient follow up
- **Ensuring Health Professionals can confidently address polymorbidity**

A long term disorder (eg depression, COPD, Asthma, Hypertension, Sleep apnoea syndromes, Diffuse Parenchymal Lung Disease, Diabetes)
Need easier access to other specialists, and new methods of learning and updating
Dear Fred

Thanks for your enquiry

In view of the circumstances around the onset of this cough (in a restaurant whilst eating) I would still think you are correct to consider foreign body inhalation. Ask the radiologist to look again at the chest radiograph but remember foreign bodies are not always radio opaque and do not always go down the right side! I think she will need bronchoscopy.

Yours,

MRP

Martyn R Partridge MD FRCP
Professor of Respiratory Medicine
National Heart and Lung Institute
Imperial College London
Royal Brompton Campus
Airway Disease Section
Guy Scadding Building
Dovehouse Street
LONDON SW3 6LY
Tel: +44(0)207 351 8174
Mobile: +44(0)7887 760151
m.partridge@imperial.ac.uk
www.imperial.ac.uk/people/m.partridge
Hi Martyn. Is it ok to do a CXR on a para 3 at 32 weeks with clinical signs of pneumonia and Empyema?
Dear Fred

Thanks for your enquiry. In view of the circumstances around the onset of this cough (in a restaurant), I think you are correct to consider foreign body inhalation. Ask the radiologist to look at the chest radiograph but remember foreign bodies are not always radio opaque and can be on the right side! I think she will need bronchoscopy.

Yours,
MRP
Weekend Mortality for Emergency Admissions


Overall adjusted odds of death was 10% higher at weekends

(OR 1.10, 95% CI 1.08 to 1.11)

p<0.001

Aylin et al 2010
Use of technology in Medical Education

- E learning
- Virtual Worlds
- Anatomage
- Use of IPads
Patient Management

Insertion of an intercostal drainage tube

Insertion of the drainage tube.

Management I Management II Management III
What might be the key benefits to e-learning?

• Available to anyone 24/7
• Trackable results
• Reduces costs
• Easily updateable
• Re-useable learning materials
• Self Paced
• Interactive
• Modular
• Permits easy and repeated self assessment
• May make up for some loss of clinical opportunity
Respiratory Medicine

Diagnosis, Differential Diagnosis and Spirometry
Respiratory Medicine

Asthma
Respiratory Medicine

COPD
Lung Disorders and Other Causes of Respiratory Symptoms

Consider this referral letter from a general practitioner to her hospital colleague. Read it through and think what further information you might need and what your differential diagnosis might be.

The Surgery
High Street
Anytown

Dear Dr. Bryant

I would be grateful for your assessment of this 61-year-old woman who is of an anxious personality and has required sedatives, antidepressants and beta-blockers in the past. Over the last few months, she has become increasingly short of breath and wheezy on occasions. She stopped smoking 20 years ago, having previously smoked approximately 20 a day for 20 years but otherwise had no respiratory problems. She is overweight, weighing 13 stone, giving her body mass index of 34 as her height is 5'11". She is not anemic, and her chest has usually been clear with a mild wheeze on occasions and poor expansion. Her predicted peak flow is about 350, but recently, when she was feeling particularly short of breath, a reducing course of steroids over a week did not bring her peak flow above 240. At present, she has a Beclomethasone 100 mcg inhaler, which she takes 2 puffs b.d. and a Ventolin inhaler p.r.n., but I am very unsure as to the reversibility of her respiratory problem and would value your assessment. Her chest x-ray was reported as normal. Many thanks for seeing her.

Dr. Anne Smith
FVC, FEV1.0, and Obstructive and Restrictive Spirometry

Spirometry involves plotting exhaled volume against time. This is performed by the patient undertaking a maximal inspiration and then a maximal expiration. The key measurements we record in spirometry are:

- The Forced Vital Capacity (FVC) which is the amount which can be blown out after a maximal inspiration.
- The Forced Expiratory Volume in one second (FEV1.0) which is the amount of the FVC exhaled in the first second of blowing out.
- The FEV1.0/FVC ratio or percentage, which we calculate from FEV1.0 and FVC.

Click 2 to learn more about the FEV1.0/FVC ratio.
Performing Spirometry

To perform spirometry:

- Ask the patient to be seated
- Ensure that the nose clip is in position
- Ask the patient
  - To take a maximal breath in
  - To then place the mouthpiece inside their mouth
  - With lips closed tightly around the mouthpiece, to blow out as hard and as fast as they can until they are red in the face
- Repeat the procedure three times, allowing the patient to recover in between.

Note how it is essential that this involves a maximal effort.
Which of the following are likely to be associated with a sudden onset of breathlessness?

Select the correct option (options):

- [ ] a. Extrinsic allergic alveolitis
- [ ] b. A supraventricular tachycardia
- [ ] c. A pneumothorax
- [ ] d. Bleeding from a duodenal ulcer
- [ ] e. A pulmonary embolus

Submit
Which of the following statements is true?

Select the correct option (options).

- a. Breast cancer is the most common cause of cancer death in women.
- b. Stopping smoking can reduce the risk of lung cancer.
- c. 50% of lung cancers are caused by smoking.
- d. Lung cancer is the most common cause of cancer death in men.
- e. Asbestos exposure is the only occupational cause of lung cancer.

That's not quite right.

a. Incorrect. Although breast cancer is the most common cancer in females, lung cancer causes more cancer deaths than does breast cancer.

b. Incorrect. While stopping smoking can reduce the risk, after a twenty year smoking history, the risk of lung cancer probably never returns to normal.

c. Incorrect. Over 90% of lung cancers are likely to be caused by smoking.

d. Correct.

e. Incorrect. The risk of lung cancer is probably increased by mining, radiation and polluted work places.
Non-Metastatic Manifestations: Skin

Non Metastatic Manifestations (Paraneoplastic Syndromes)

SKIN
- Acanthosis Nigricans
- Erythroderma
- Pruritus

Skin non-metastatic manifestations also occur, and the commonest is probably pruritus. However, a rare but distinctive dermatological complication that can occur is that of Acanthosis Nigricans.

In this condition, a jet-black discolouration of the axillary creases occurs particularly with adenocarcinomas of the stomach, pancreas or lung.

Acanthosis Nigricans

Click Next to continue.
That's right.

a. Incorrect. Unless encysted, a collection of fluid in the pleural space would fill the lower part of the hemithorax. The cardinal feature of an effusion is that it obliterates the cardio-diaphragmatic angle and the upper border is curvilinear towards the diaphragm.

b. Correct. The rounded, dense and unilateral nature of this shadow suggests a mass lesion in the left lower lobe.

c. Incorrect. The rounded nature of this lesion suggests a mass lesion, whereas a lesion indicating pneumonia, if homogenous, would generally conform to the boundaries of a lobe or segments of a lobe.

d. Incorrect. Whilst this shadow could be interpreted as being perihilar in distribution, it is too dense and very unilateral for pulmonary oedema.

Click Close to proceed with the exercise.
Investigations to perform

Having examined the patient and found him to be breathless with a fast respiratory rate and little in the way of breath sounds to be heard on the left hand side, which investigations would you wish to perform?

- [ ] A full blood count
- [ ] Estimation of Oxygen Saturation
- [ ] ECG
- [ ] A Chest radiograph
Investigations

Investigations to perform

- A full blood count
  This might be part of your "routine" assessment but is unlikely to be a crucial factor in determining the differential diagnosis.

- Estimation of Oxygen Saturation
  By oximetry or blood gas sampling. Yes a reasonable test to quantify an abnormality but it will not by itself help you make a diagnosis.

- ECG
  Yes!, this might help you exclude alternative diagnoses but it will not explain, for example, the absence of breath sounds which you detected when examining the left side of the chest.

- A Chest radiograph
  Yes!, this was performed and is shown next...
Click on the Lung Edge to confirm that you have seen the correct line.

That's Right!

This is the lung edge. In cases of doubt always request a CT scan of the Thorax before inserting a chest drain.
Patient Management

Insertion of an intercostal drainage tube

Insertion of the drainage tube.
Patient Management

Underwater drain

Tube being connected to underwater drain

Underwater drain

Management I

Management II

Management III
Management of the underwater drain

Management of an underwater drain. Do's and don'ts of chest drains. (Click)

- Don't clamp drains
- Drain level
- Fluid Swinging
- Froth on the water
- Fluid like a millpond

Do not clamp drains other than when changing the bottle.
Patient Management

Management of the underwater drain

Management of an underwater drain. Do’s and don’ts of chest drains. (Click)

- Don’t clamp drains
- Drain level
- Fluid swinging
- Froth on the water
- Fluid like a millipond

Always check that the fluid in the tube is swinging with respiration. If not, the tube is blocked.
Patient Management

Management of the underwater drain

Management of an underwater drain. Do's and don'ts of chest drains. (Click)

- Don't clamp drains
- Drain level
- Fluid Swinging
- Froth on the water
- Fluid like a millpond

A swinging fluid level in the tube, froth on the surface of the water in the bottle, and visible bubbling suggests an ongoing persistent leak. Consider low pressure suction.
Do students like Respiratory E learning and is it effective in knowledge transfer?

- **Randomised Control Trial**
- **Final year volunteer medical students** \( (n=137) \)
  - A didactic lecture \( (n=40) \)
  - A face-to-face session of equivalent content using interactive case histories \( (n=40) \).
  - The same case histories delivered via a customised web-based interactive learning tool \( (n=57) \).

Smith SF, Roberts NJ and Partridge MR
BMC Medical Education 2007;7:41
Effect of teaching format on overall knowledge transfer

![Bar chart showing score comparison between taught items and non-taught items for Interactive, Didactic, and Web-based teaching formats.](image-url)
Effect of teaching on total data interpretation scores for each teaching format

Correct responses (%)
Effect of teaching on scores for interpretation of spirometry reports for each teaching format
Have others shown the same?
Evaluation of a web based ECG-interpretation programme for undergraduate medical students

- Web based comprehensive ECG interpretation programme vs conventional teaching of ECG
- 20 out of 32 students accessed programme in a 2 month period
- Subjectively graded programme as 4.1 for usefulness (1=Bad, 5=Very Good)
- Diagnostic test (max score 16): 9.7 in E Intervention group vs 8.1 for the control group (p=0.03)

Nilsson M et al BMC Medical Education 2008, 8:25
Evaluate, Evaluate, Evaluate
Professor Martyn Partridge (Group Leader)

The department of Respiratory Medicine at Charing Cross Hospital is part of the NHRI Division of the Faculty of Medicine of Imperial College London, and is situated on the 5th floor of the main Charing Cross Hospital building.
Differential Diagnosis

Touch this sign to make a Differential Diagnosis before purchasing tests

Investigations

Right click respective object on table and pay for the test
Conclusions

• The Health burden in Western countries has changed dramatically over the last 2-3 decades.

• The system of health care on offer has not changed (sufficiently) to match

• New emphases are needed on shared decision making, support for self management, easier follow up and methods to enhance compliance

• Unless we get this right the burden on acute services will rise

• Technology can provide many solutions for this change in emphasis
Focus the technology where it is needed
Current patterns of care no longer sustainable

‘Additionally, rising life expectancy is bringing about increasingly complex long-term health issues. **Doctors need to adopt new models of care, using new technology** and other staff more effectively, working closely with patients to provide more care in the community, with an emphasis on shared decision making and self-management.’
Thank You!

www.imperial.ac.uk/people/m.partridge
The electronic interface:
1) The changing face of medicine; where might electronic interventions help? *Martyn Partridge*
2) The acute physician and technology: the Australian experience. *Alasdair MacDonald*
3) How good are patient–orientated medical apps? *Kit Huckvale*
4) Solving sepsis with iPads. *Gary Davies*