A model for pharmacist drug titration clinics

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Presentation title: A model for pharmacist drug titration clinics

Speaker: Paul Forsyth

Conflicts of interest: Previous honoraria for scientific advice and lecture fees from Novartis, Vifor, and Servier

Presentation slide distribution: These presentation slides will be added to www.bsh.org.uk after the meeting
Objectives

- Background to pharmacist care in HF
- Developments in UK pharmacy
  - Strategic vision
  - Prescribing
  - Recognising specialism and developing expertise
- Bringing these together: Post-MI LVSD ‘Teach & Treat’
Background to Pharmacist Care in HF
Pharmacists & HF: Not a New Concept

Effects of a Home-Based Intervention Among Patients With Congestive Heart Failure Discharged From Acute Hospital Care

Simon Stewart, BA, BN; Sue Pearson, BA; John D. Horowitz, MBBS, PhD

From the Cardiology Unit of The Queen Elizabeth Hospital/University of Adelaide, Woodville, South Australia.


Abstract

Background We examined the effect of a home-based intervention (HBI) on readmission and death among "high-risk" patients with congestive heart failure discharged home from acute hospital care.

Methods Hospitalized patients with congestive heart failure and impaired systolic function, intolerance to exercise, and a history of 1 or more hospital admissions for acute heart failure were randomized to either usual care (n=48) or HBI at 1 week after discharge (n=49). Home-based intervention comprised a single home visit (by a nurse and pharmacist) to optimize medication management, identify early clinical deterioration, and intensify medical follow-up and caregiver vigilance as appropriate. The primary end point of the study was frequency of unplanned readmissions plus out-of-hospital deaths within 6 months of discharge. Secondary end points included duration of hospital stay and overall mortality.

Results During follow-up, patients in the HBI group had fewer unplanned readmissions (36 vs 63; P=.03) and fewer out-of-hospital deaths (1 vs 5; P=.11): 0.8±0.9 vs 1.4±1.8 (mean±SD) events per patient assigned to HBI and usual care, respectively (P=.03). Patients in the HBI group also had fewer days of hospitalization (261 vs 452; P=.05) and fewer total deaths (6 vs 12; P=.11). Patients assigned to usual care were more likely to experience 3 or more readmissions for acute heart failure (P=.02). Predictors of unplanned readmission were (1) 14 days or more of unplanned readmission during the 6 months before study entry (odds ratio [OR], 5.2; 95% confidence interval [CI], 1.8–16.2), (2) previous admission for acute myocardial ischemia (OR, 3.3; 95% CI, 1.2–9.3), and (3) an albumin plasma concentration of 38 g/L or less (OR, 2.4; 95% CI, 1.2–6.0). Home-based intervention was also associated with a trend toward reduced risk of unplanned readmission (OR, 0.4; 95% CI, 0.2–1.1).
Pharmacist Care of Patients With Heart Failure
A Systematic Review of Randomized Trials
Sheri L. Koshman, BScPharm, PharmD, ACPR; Theresa L. Charrois, BSc(Pharm), MSc;
Scot H. Simpson, BSP, PharmD, MSc; Finlay A. McAlister, MD, MSc, FRCP; and
Ross T. Tsuyuki, BSc(Pharm), PharmD, MSc, FCSHP
Arch Intern Med. 2008;168(7):687-694

Pharmacist-involved care for patients with heart failure and acute coronary syndrome: a systematic review with qualitative and quantitative meta-analysis
J. E. Kang*† MSc, BCOP MS, N. Y. Han‡ PhD, J. M. Oh‡ PharmD, H. K. Jin* MSc, H. A. Kim* MSc, I. J. Son† PhD and
S. J. Rhie‡ PharmD PhD
Journal of Clinical Pharmacy and Therapeutics, 2016, 41, 145-157

Clinical Pharmacy Services in Heart Failure: An Opinion Paper from the Heart Failure Society of America and American College of Clinical Pharmacy Cardiology Practice and Research Network
Sherry K. Milfred-LaForest, Sheryl L. Chow, Robert J. DiDomenico, Kathleen Dracup,
Christopher R. Ensor, Wendy Gattis-Stough, J. Thomas Heywood, JoAnn Lindenfeld,
Robert L. Page, II, J. Herbert Patterson, Orly Vardeny, and Barry M. Massie
(Pharmaco therapy 2013;33(5):529-548)
## Recognition in Guidelines

### Table 14.1 Characteristics and components of management programmes for patients with heart failure

<table>
<thead>
<tr>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Should employ a multidisciplinary approach (cardiologists, primary care physicians, nurses, pharmacists, physiotherapists, dieticians, social workers, surgeons, psychologists, etc.).</td>
</tr>
<tr>
<td>Should target high-risk symptomatic patients.</td>
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<tr>
<td>Should include competent and professionally educated staff.</td>
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<table>
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<tr>
<th>Components</th>
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</thead>
<tbody>
<tr>
<td>Optimized medical and device management.</td>
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<tr>
<td>Adequate patient education, with special emphasis on adherence and self-care.</td>
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<tr>
<td>Patient involvement in symptom monitoring and flexible diuretic use.</td>
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<tr>
<td>Follow-up after discharge (regular clinic and/or home-based visits; possibly telephone support or remote monitoring).</td>
</tr>
<tr>
<td>Increased access to healthcare (through in-person follow-up and by telephone contact; possibly through remote monitoring).</td>
</tr>
<tr>
<td>Facilitated access to care during episodes of decompensation.</td>
</tr>
<tr>
<td>Assessment of (and appropriate intervention in response to) an unexplained change in weight, nutritional status, functional status, quality of life, or laboratory findings.</td>
</tr>
<tr>
<td>Access to advanced treatment options.</td>
</tr>
<tr>
<td>Provision of psychosocial support to patients and family and/or caregivers.</td>
</tr>
</tbody>
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### 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

Key to the success of these programmes is coordination of care along the continuum of HF and throughout the chain of care delivered by the various services within the health care system. This necessitates close collaboration between HF practitioners (primarily cardiologists, HF nurses and general practitioners) and other experts, including pharmacists, dieticians, physiotherapists, psychologists, palliative care providers and social workers. The content and structure of HF management programmes may vary in different countries and health care settings. The components shown in Table 14.1 are recommended.

European Heart Journal (2016) 37, 2129–2200
doi:10.1093/eurheartj/ehw128
New Developments in Pharmacy
Prescription for Excellence: A Vision and Action Plan

By 2023 all pharmacists will require to be NHS accredited clinical pharmacist\(^2\) independent prescribers in order to provide clinical care to patients in the community.

... 

In the management of long term conditions they will work in partnership with the medical profession so that post diagnosis caseloads can be allocated to these pharmacists to optimise their complementary skills.
Pharmacist Training & Independent Prescribing

- 5 years of training (4 years undergraduate and 1 year preregistration)

- Regulations to support independent prescribing since 2006
  - Need at least two years post-registration experience
  - Training programme typically run over 6 months
    - Part-time
    - Face-to-face teaching and self-directed study
    - Minimum of 26 days of teaching
    - Additional minimum 12 days of learning in a practice environment whilst being mentored by a medical practitioner

Reference [https://www.pharmacyregulation.org/education/pharmacist-independent-prescriber](https://www.pharmacyregulation.org/education/pharmacist-independent-prescriber)
# Up-take of Pharmacist Prescribing in Scotland

<table>
<thead>
<tr>
<th>Total number of patient-facing prescribers trained and in training</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>750</td>
<td>833</td>
<td>930</td>
<td>1096</td>
</tr>
</tbody>
</table>

| Total number reported as actively prescribing | 333 (44%) | 410 (49%) | 472 (51%) | 535 (49%) |

## Active and Inactive Prescribers by Board

![Bar chart showing active and inactive prescribers by board](chart.png)

Developing Pharmacists: Becoming an Expert

- Beyond the rhetoric - What makes an expert?
- Valuing and recognising continuing development of professional expertise

<table>
<thead>
<tr>
<th>Competency</th>
<th>Developmental Descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Advanced Stage I</td>
</tr>
<tr>
<td>1.1 Expert Skills and Knowledge</td>
<td>Demonstrates general pharmaceutical skills and knowledge in core areas. In addition for patient focussed roles: Is able to plan, manage, monitor, advise and review general pharmaceutical care programmes for patients in core areas.</td>
</tr>
<tr>
<td>1.2 Delivery of Professional Expertise</td>
<td>Demonstrates accountability for delivering professional expertise and direct service provision as an individual.</td>
</tr>
<tr>
<td>1.3 Reasoning and Judgement</td>
<td>Demonstrates ability to use skills in a range of routine situations requiring analysis or comparison of a range of options. Recognises priorities when problem-solving and identifies deviations from the normal pattern.</td>
</tr>
</tbody>
</table>

Mastery

- Advances the knowledge base in defined area(s).
- In addition for patient focussed roles: Advances in-depth/complex pharmaceutical care programmes for patients.
- Demonstrates accountability for the delivery of professional expertise at a defined higher level.
- May include providing expertise and service delivery nationally or at a strategic level.

Post-MI LVSD ‘Teach & Treat’
Post-MI LVSD: The Middle Child of Heart Failure?

- Glasgow have an excellent HF nursing service for HF-REF
  - Legacy of Lynda Blue et al

- Low achievement in optimisation of secondary prevention in Post-MI patients with significant LVSD
  - Dr Clare Murphy & Dr Chris Rush (Royal Alexandra Hospital)
    - Mean ACEI dose = 43.8% of target
    - Mean BB dose = 30.9% of target

- LVSD Post-MI independently predicts mortality¹

- Dr Clare Murphy approached pharmacy to develop a pilot service

Pilot: ‘Before’ & ‘After’ Study (1)

- **Inclusion:** Moderate to severe (LVEF≤40%) LVSD Post-MI
- **Setting:** Patients discharged from RAH (Paisley)
- **Methods:** Retrospective ‘usual care’ patients identified through a cardiac rehab database of admissions (01/09/2012 to 31/08/2013). Prospective ’intervention’ patients identified during admission by cardiac rehab nurses (01/09/2013 to 31/08/2014) and referred at the time of hospital discharge to pharmacist clinic in addition to usual care. The pharmacist prescribed in line with ESC guidelines. Consultant Cardiologists provided clinical support.
- **Staff:** Two specialist cardiology pharmacists
- **Results:** n=108 patients (n=57 retrospective and n=51 prospective)
  
  Pharmacist reviewed patients a mean 4.6 times.

**Reference:** European Journal of Heart Failure (2015) 17 (Suppl. 1), 341 doi:10.1002/ejhf.277
Use of Disease Modifying Medication at End of Cardiac Rehab Programme

- ACEI
  - Pre Pharmacist (n=57): 89.5%
  - Post Pharmacist (n=51): 94.1%

- Beta-Blocker
  - Pre Pharmacist (n=57): 82.5%
  - Post Pharmacist (n=51): 96.1%

- MRA
  - Pre Pharmacist (n=57): 24.6%
  - Post Pharmacist (n=51): 49.0%

Mean % of Target Dose of Disease Modifying Medication at End of Cardiac Rehab Programme

- ACEI
  - Pre Pharmacist (n=57): 43.8%
  - Post Pharmacist (n=51): 71.7%

- Beta-Blocker
  - Pre Pharmacist (n=57): 30.9%
  - Post Pharmacist (n=51): 55.9%

- MRA
  - Pre Pharmacist (n=57): 15.8%
  - Post Pharmacist (n=51): 35.3%

Reference:
European Journal of Heart Failure (2015) 17 (Suppl. 1), 341
doi:10.1002/ejhf.277
From Pilot to ‘Teach & Treat’

- Dovetail with new Scottish Government Pharmacy Vision- ‘Prescription for Excellence’ ¹
  - ‘…….in the management of long term conditions pharmacy will work in partnership with the medical profession so that post diagnosis caseloads can be allocated to these pharmacists…..’

- Short term funding secured from NHS Education for Scotland (NES)

- Long-term NHS Greater Glasgow & Clyde ‘buy in’
  - City-wide coverage
  - Widen service to include all grades of LVSD (not just moderate to severe as in pilot)

New Vision: Mixed Pharmacist Model

- ‘Simple’ Patients: General Practice Based Pharmacists (e.g. Health Centres etc)
  - ACEI (or ARB)
  - Beta-blocker
  - DAPT
  - Lipid lowering medication
  - BP lowering medication

- ‘Complex’ Patients: Secondary care based pharmacist clinic, under governance of consultant
  - MRA
  - Diuretics
  - Anti-anginals
  - Ivabradine
  - Devices (e.g. CRT / ICD)
  - ARNI
‘Teach’

Training

- Clinical skills training
- Venepuncture training
- Lectures / workshops on heart failure and acute coronary syndrome
- Shadowing
  - Coronary care ward rounds
  - Consultant outpatient clinics
  - Specialist pharmacist outpatient clinics
  - Heart failure nurse clinics

Assessment

- OSCE (and supervision of initial practice if running secondary care clinic)
- Multiple choice exam
‘Treat’

- Incident MI with LVSD (Cardiac rehab nurses refer to Specialist Cardiology Pharmacist)
  - Patient reviewed at Specialist Cardiology Pharmacist Clinic (secondary care)
  - Patient triaged to appropriate clinician

**Usual GP care**

- ‘Simple’ asymptomatic Post-MI LVSD (e.g. LVEF 40-50% and no HF or ischaemia)
  - Patient referred to Primary Care Pharmacist for optimisation
  - Communication back to Specialist Cardiology Pharmacist once optimised and/or if patient develops problems

**Usual Cardiologist care**

- ‘Complex’ Post-MI LVSD (e.g. LVEF ≤ 40% and/or NYHA 2 or ischaemia)
  - Patient retained in Specialist Cardiology Pharmacist Clinic for optimisation
  - Pharmacist organises re-echo and ECG as needed (for device consideration)
  - Communication back to Cardiologist once optimised

- Obvious ‘high risk’ HF-REF (e.g. LVEF ≤ 40% and/or NYHA 3/4 or symptoms of congestion)
  - Patient referred to HF nurses for optimisation
Example: Royal Alexandra Hospital Area Clinics
Example: Clinic Template on Trakcare

- 15 minute appointment slots
  - History
  - Clinical examination, including manual BP/pulse, chest auscultation
  - Venepuncture
  - Hand written prescription
Example:
Transfer into Primary Care Clinic

Dear Dr.,

Attendance: Specialty - Cardiology; Clinic - RAPFCA4-PHARMACIST P FORSYTH TUES PM CLINIC
Date and Time of Appointment - 08/03/2016 13:15

Follow Up: Two weeks at community clinic

Medication Note:
Bisoprolol increased to 5mg daily

Clinical Comments:
I reviewed the above patient for the first time today following a recent inferior STEMI with mild LVSD.

Today he was NYHA 1. He had no acute signs or symptoms of heart failure or chest pain. His BP averaged 105/70mmHg. His pulse was 74bpm and regular.

I have today increased his Bisoprolol to 5mg daily. He will be followed up by one of my colleagues in our community clinic in approximately two weeks time.

Electronically Signed: Pharmacist Paul Forsyth, Pharmacist
Attendance: Specialty - Cardiology; Clinic - IRJBCA0-PHARMACIST
PM
Date and Time of Appointment - 26/05/2017 14:30

Follow Up: Two weeks back at clinic

Medication Note:
Bisoprolol increased to 7.5mg daily.

Clinical Comments:
I reviewed [Patient Name] for the first time today following a STEMI in [Hospital Name] with severe LVSD.

Today she was well. She was NYHA 1. She had no other acute signs or symptoms of heart failure, other than a slight increase in tiredness. She had no chest pain. Her BP was 116/74mmHg. Her pulse was 77bpm and regular.

I have today increased her Bisoprolol to 7.5mg daily. We will see her back at clinic in two weeks time to assess her response.

Given her severe LVSD at baseline she will need re-echoed at some stage. She does not have local cardiologist follow-up on the system yet and I have copied in Dr [Name] today to highlight this and her re-echo need to him. Her level of LV dysfunction and angiography findings also do not necessarily correlate well and I do wonder whether she would benefit from prompt local follow-up.
Evaluation: ‘Cashed’ prescription data

- CHI number = can link to other NHS datasets
- Drug and drug class is captured
- Drug dose is captured
- Drug instructions are captured
- Drug quantities captured (useful for working out a medication adherence proxy)
- Date captured
- Prescriber captured
### Example CHI-linked data from local Post-MI LVSD Audit

<table>
<thead>
<tr>
<th>Number of prescriptions (and quantity)</th>
<th>Nov 14</th>
<th>Dec 14</th>
<th>Jan 15</th>
<th>Feb 15</th>
<th>Mar 15</th>
<th>Apr 15</th>
<th>May 15</th>
<th>Jun 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta-blockers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BISOPROLOL FUMAR_TAB 1.25MG</td>
<td>1 (28)</td>
<td>1 (28)</td>
<td>1 (28)</td>
<td>1 (56)</td>
<td>1 (56)</td>
<td>1 (56)</td>
<td></td>
<td>1 (56)</td>
</tr>
<tr>
<td>ACEI/ARB</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>RAMIPRIL_CAP 2.5MG</td>
<td>1 (28)</td>
<td>2 (56)</td>
<td>1 (56)</td>
<td>1 (56)</td>
<td></td>
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<td>1 (56)</td>
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<table>
<thead>
<tr>
<th>Date</th>
<th>Number</th>
<th>Days</th>
<th>Instruction</th>
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<tbody>
<tr>
<td>Nov 14</td>
<td>1</td>
<td>28</td>
<td>ONE TO BE TAKEN EACH I ONE TO BE TAKEN EACH DAY</td>
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<tr>
<td>Nov 14</td>
<td>1</td>
<td>28</td>
<td>ONE TO BE TAKEN EACH I ONE TO BE TAKEN EACH DAY</td>
</tr>
<tr>
<td>Jan 15</td>
<td>2</td>
<td>56</td>
<td>ONE TO BE TAKEN EACH I ONE TO BE TAKEN EACH DAY</td>
</tr>
<tr>
<td>Jan 15</td>
<td>2</td>
<td>56</td>
<td>ONE TO BE TAKEN EACH I ONE TO BE TAKEN EACH DAY</td>
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<tr>
<td>Feb 15</td>
<td>1</td>
<td>56</td>
<td>ONE TO BE TAKEN EACH I ONE TO BE TAKEN EACH DAY</td>
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<tr>
<td>Mar 15</td>
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<td>56</td>
<td>ONE TO BE TAKEN EACH I ONE TO BE TAKEN EACH DAY</td>
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<td>May 15</td>
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<td>Nov 14</td>
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<td>ONE TO BE TAKEN EACH I ONE TO BE TAKEN EACH DAY</td>
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<td>Dec 14</td>
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<td>Jan 15</td>
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<td>Feb 15</td>
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<td>Mar 15</td>
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<td>56</td>
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<tr>
<td>May 15</td>
<td>1</td>
<td>56</td>
<td>ONE TO BE TAKEN EACH I ONE TO BE TAKEN EACH DAY</td>
</tr>
</tbody>
</table>
Example CHI-linked data from local Post-MI LVSD Audit

<table>
<thead>
<tr>
<th>Beta-blockers</th>
<th>BISOPROLOL FUMAR_TAB 1.25MG</th>
<th>BISOPROLOL FUMAR_TAB 2.5MG</th>
<th>BISOPROLOL FUMAR_TAB 5MG</th>
</tr>
</thead>
<tbody>
<tr>
<td>BISOPROLOL FUMAR_TAB 1.25MG</td>
<td>1 (28)</td>
<td>1 (28)</td>
<td>1 (28)</td>
</tr>
<tr>
<td>BISOPROLOL FUMAR_TAB 2.5MG</td>
<td>1 (28)</td>
<td>1 (28)</td>
<td>1 (28)</td>
</tr>
<tr>
<td>BISOPROLOL FUMAR_TAB 5MG</td>
<td>1 (28)</td>
<td>1 (56)</td>
<td>1 (56)</td>
</tr>
</tbody>
</table>

| BISOPROLOL FUMAR_TAB 1.25MG | Sep 14 | 1 | 56 | 1 TAB DAILY | 1 TAB DAILY |
| BISOPROLOL FUMAR_TAB 1.25MG | Nov 14 | 1 | 56 | ONE TO BE TAKEN AT NIGHT ONE TO BE TAKEN AT NIGHT |
| BISOPROLOL FUMAR_TAB 2.5MG | Dec 14 | 1 | 56 | ONE TO BE TAKEN EACH ONE TO BE TAKEN EACH |
| BISOPROLOL FUMAR_TAB 2.5MG | Feb 15 | 2 | 168 | ONE TO BE TAKEN EACH ONE TO BE TAKEN EACH |
| BISOPROLOL FUMAR_TAB 2.5MG | Feb 15 | 2 | 168 | ONE TO BE TAKEN TWICE ONE TO BE TAKEN TWICE |
| BISOPROLOL FUMAR_TAB 5MG | May 15 | 1 | 112 | ONE TWICE DAILY - WEEK ONE TWICE DAILY - WEEKLY DISPENSE |
Results vs Historic Audits: ACEI
(01.09.2013 to end 08.2017)

Achievement of ACEI Dosing in Baseline Audits vs Pharmacist-led Clinics for Post-MI LVSD

Historic Royal Alexandra Hospital (n=133)
Historic Glasgow Royal Infirmary (n=58)
Historic New Victoria Hospital (n=76)
Historic Southern General Hospital (n=64)
Pharmacist-led Clinic (n=885)
Results vs Historic Audits: βB
(01.09.2013 to end 08.2017)

Achievement of βB Dosing in Baseline Audits vs Pharmacist-led Clinics for Post-MI LVSD

- Historic Royal Alexandra Hospital (n=133)
- Historic Glasgow Royal Infirmary (n=58)
- Historic New Victoria Hospital (n=76)
- Historic Southern General Hospital (n=64)
- Pharmacist-led Clinic (n=885)
Status Quo: Clinics

= Central ‘specialist’ hub

= Primary care ‘generalist’ spoke

= Primary care ‘generalist’ spoke planned
Sharing Best Practice
Next steps: Scotland-wide roll-out

- Funding (start up costs for one year) secured from NHS NES for national roll-out
  - Plan supported by Scottish Government National Advisory Committee for Heart Disease
  - Plan to roll-out to two Board areas per year

- NHS Highland
  - Started Sept 2017

- NHS Tayside
  - Starting Jan 2018
Influencing Government Strategy

ACHIEVING EXCELLENCE IN PHARMACEUTICAL CARE
A STRATEGY FOR SCOTLAND

Published by The Scottish Government, August 2017

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Teach and Treat clinics
The first Pharmacy Teach and Treat service started in NHS GCC in 2014. It aimed at optimising people’s treatment following a heart attack, utilising the skills of pharmacist independent prescribers (IP). It is widely recognised that best evidence based care for this patient group requires optimising doses of specific medicines. The medicines are initiated in hospital at low doses and should be increased, with supervision and monitoring, over time. Research findings however demonstrated that frequently the medications were not altered as recommended. A pharmacy team were asked if they could help address this locally. Working closely with the multidisciplinary team, the pharmacists instigated pharmacist-led clinics to follow up with people after discharge from hospital. The clinic sessions consist of a 15 minute face-to-face consultation in the out-patients department. The consultations include taking a clinical history, appropriate blood tests, blood pressure measurement and a physical examination including chest auscultation. Following assessment, the pharmacist IP optimises the medicines, issues a prescription and arranges a follow up.

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ACTION:
We will work with the Modern Outpatient Programme to ensure a strategic alignment of the pharmaceutical contribution to its work.
Heart failure: UK wide collaboration

- **UKCPA Heart Failure Group set up**
  - Alison Warren (Brighton)
  - Janine Beezer (Sunderland)
  - Joanne Bateman (Chester)
  - Rocco Hadland (North Wales)
  - Clare Thomson (London)

- **Meet ~3 times per year**
  - Share practice models
  - Represent pharmacy
    - Observer on British Society for Heart Failure Board
    - NICE appraisals
  - Run training days / events
  - Future R&D collaboration

- **Curriculum for pharmacists specialising in heart failure developed (submitted for publication)**
Summary
Summary

- Pharmacist independent prescribers are a largely untapped resource in the UK

- UK pharmacy strategy/policy is aiming to deliver more care for patients with long-term conditions

- Heart failure seems an apt therapeutic area to utilise these clinicians

- Essential elements needed for success
  - Additional initial training and mentorship
  - Multi-disciplinary working
  - Targeted at areas of unmet clinical need
  - Evaluation
Thank You!
Questions