E5: Clinical decision support with the BMJ Best Practice Comorbidities Manager: the role of integration and localisation in quality improvement and safer care for patients with multiple illnesses

BMJ Best Practice

The role of integration and localisation in clinical quality improvement and safer care for patients with multiple illnesses

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Agenda

- Patient perspective
- Quality and safety of care for patients with comorbidities
- BMJ Best Practice
- BMJ Best Practice Comorbidities Manager
- Clinical Scenario
- Electronic Health Record Integration
- Localisation
- Your feedback
- Patient perspective

The voice of patients - BMJ patient advocate

- Important but commonly overlooked
- Maybe more important in patients with multiple illnesses
- Needs are very specific

The voice of patients

- “I really want my healthcare team to understand that **they can't just treat one thing**, I now have four health conditions. Each medication may have a knock-on with the others, I went through a really painful time when **my cancer meds interfered with my arthritis** which then **caused a really dark depression**. It took me and my family a long time to recover mentally and physically. So when I see a healthcare professional, they need to have some knowledge of kidney cancer, ankylosing spondylitis, epilepsy, depression **and ME**!”

- “I take quite a few pills, quite a bit of medication. **My basic problems are diabetes and heart…and high blood pressure of course. What else? Arthritis**. I elevate my legs to take care of the arthritis in the knees ….”

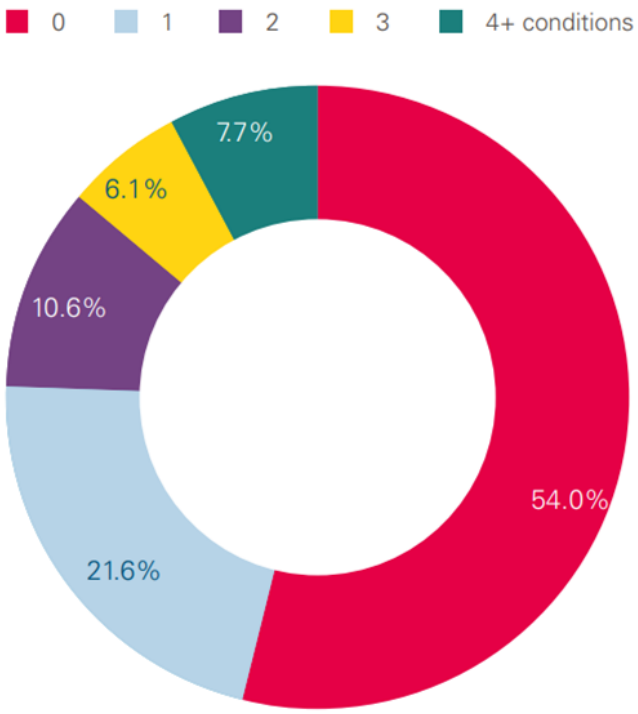
- “**What is the definition of a coexisting condition**? Is this based on diagnoses or the patient perspective? Is it a fixed number or fluctuating depending on today's main problem?”

Acknowledgement: Jools Symons. ABC of multimorbidity.

Impact of comorbidities on patients

- Lower quality of life
- Lower physical function
- Poor emotional well-being
- Uncertainty and lack of control
- Polypharmacy and poor adherence
- Multiple doctors and multiple appointments
- Confused communications
- And **more** …

Figure 1: Percentage of people with 0, 1, 2, 3 and 4+ conditions



24% of people in England live with 2+ conditions (14.2 million people)

8% live with 4+ conditions (4.7 million people)

Briefing: Understanding the health care needs of people with multiple health conditions

Impact on measurement of quality of care

- Some measures have been used to assess the quality of care in patients with multiple chronic conditions.
- However, the reliance on measures oriented towards single conditions has been a major deficiency.
- More measures are needed to provide a more comprehensive way of evaluating quality of care in this group of patients.

Pillay M, Dennis S, Harris MF. Quality of care measures in multimorbidity. Aust Fam Physician. 2014 Mar;43(3):132-6. 27 studies. S P O processes-single disease specific

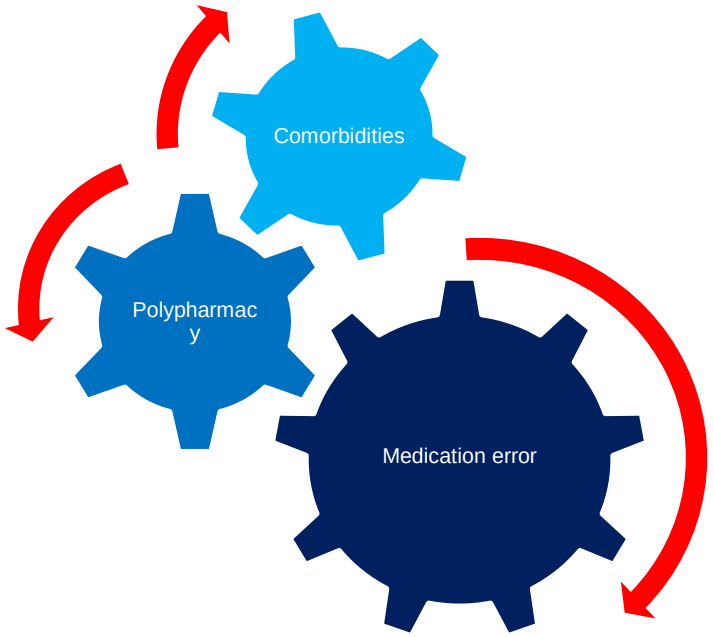
Impact of comorbidities on quality of care

- Not enough evidence

But

- Comorbidities – polypharmacy (sometimes > 8 drugs)

- Polypharmacy - medication error
- Physicians involved in caring for these patients report that current decision support is inadequate to optimize benefits and minimize harms in these patients with complex needs



Briefing: Understanding the health care needs of people with multiple health conditions
Nobili A, Marengoni A, Tettamanti M *et al*. Association between clusters of diseases and polypharmacy in hospitalized elderly patients: results from the REPOSI study. *Eur J Intern Med* 2011; **22**: 597–602.
Barber ND, Alldred DP, Raynor DK, Dickinson R, Garfield S, Jesson B, Lim R, Savage I, Standage C, Buckle P, Carpenter J, Franklin B, Woloshynowych M, Zermansky AG. Care homes' use of medicines study: prevalence, causes and potential harm of medication errors in care homes for older people. Qual Saf Health Care. 2009 Oct;18(5):341-6.
Sinnott C, McHugh S, Browne J, Bradley C. GPs' perspectives on the management of patients with multimorbidity: systematic review and synthesis of qualitative research. BMJ Open 2013

Impact of comorbidities on quality of care

- “Multimorbidity appears to be associated with worse quality of care when measured using a **patient-centric approach**”

- A higher number of individual conditions is associated with lower ratings of communication. Patients with more chronic conditions gave their doctors modestly lower patient–doctor **communication scores** than their healthier counterparts

Impact of multimorbidity on quality and safety of healthcare. Valderas et al. approach

Fung CH, Setodji CM, Kung FY, Keesey J, Asch SM, Adams J, McGlynn EA. The relationship between multimorbidity and patients' ratings of communication. J Gen Intern Med. 2008 Jun;23(6):788-93. doi: 10.1007/s11606-008-0602-4. Epub 2008 Apr 22. PMID: 18427902; PMCID: PMC2517863. surp

Quality care is evidence based care

- Implementation science - to ensure evidence-based medicine is practiced
- But where is the evidence?
- Missing because patients with multimorbidity have **excluded.** And are still being excluded.

Excluded!

Exclusion of patients with concomitant chronic conditions in ongoing randomised controlled trials targeting 10 common chronic conditions and registered at ClinicalTrials.gov: a systematic review of registration details

- All ongoing RCTs registered from 1 January 2014 to 31 January 2015 that assessed an intervention targeting adults with coronary heart disease (CHD), hypertension, heart failure, stroke/transient ischaemic attack, atrial fibrillation, type 2 diabetes, chronic obstructive pulmonary disease, painful condition, depression and dementia with a target sample size ≥100.
- Among 319 ongoing RCTs, despite the high prevalence of the concomitant chronic conditions, patients with these conditions were **excluded in 251 trials (79%)**. For example, although **91% of patients with CHD had a concomitant chronic condition, 69% of trials targeting such patients excluded patients with concomitant chronic condition(s).** When considering the co-occurrence of 2 chronic conditions, 31% of patients with chronic pain also had depression, but **58% of the trials targeting patients with chronic pain excluded patients with depression**. Only 37 trials (12%) assessed interventions specifically targeting patients with concomitant chronic conditions; 31 (84%) excluded patients with concomitant chronic condition(s).

Buffel du Vaure C, Dechartres A, Battin C, *et al*. Exclusion of patients with concomitant chronic conditions in ongoing randomised controlled trials targeting 10 common chronic conditions and registered at ClinicalTrials.gov: a systematic review of registration details. *BMJ Open* 2016;**6**

Improving quality improvement

Problems with QI

- Too many small-scale time-limited activities
- Project-based approach
- Wheel reinvention
- Improvement evaporation
- Magic bullets
- Not sharing
- Many hands - “autonomous, highly distributed and heterogeneous yet interdependent actors”
- Not adhering to pdsa cycles or not doing them properly
- QI as “patch ups”

Dixon-Woods M. How to improve healthcare improvement-an essay by Mary Dixon-Woods. BMJ. 2019 Oct 1;367:l5514.

Improving quality improvement

When you add comorbidities

- Small-scale time-limited activities - won't work
- Project-based approach - holistic care is not a "project"
- Magic bullets - single interventions will not work
- Uniprofessional projects - we need teams
- Not joining things up - wristbands
- QI as "patch ups" - improving management of single conditions - when so many patients have multiple conditions

Quality improvement

In the context of complexity

- Programmatic approach - supported by resources
- Organisational and systems strengthening
- Scale from start
- Integrate
- Interprofessional
- Strategic but allow localisation
- Transparency and explicability
- Knowledge and skills training

Dixon-Woods M, Martin GP. Does quality improvement improve quality? Future Hosp J. 2016 Oct;3(3):191-194.

Quality improvement

In the context of complexity and comorbidities

- “Despite all the rhetoric about ‘system-based’ approaches and balancing measures, **most QI projects are focused on a single condition or pathway**, and **they do not always consider the whole range of possible effects** on whole organisations or systems they might produce.

- “One checklist or sticker might well be a good thing, for example. But too many – the problem known as polyformacy – may start to produce unwanted effects. QI projects tend to focus on single, relatively well-bounded processes, often (though not always) focused on a single condition.”

  Mary Dixon-Woods

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6399637/

BMJ Best Practice

BMJ Best Practice is a p**oint of care clinical decision support tool** particularly useful for junior doctors, multidisciplinary teams, specialists working outside of their specialty and GPs.

It is **uniquely structured** around the patient consultation with advice on symptom evaluation, test ordering and treatment approach.

Evidence based, continually updated, practical, accessible.

- Ranked one of the **best clinical decision support tools** for health professionals worldwide*
- **Scored highest** in an independent study of diagnostic decision support tools**
- Available nationally to healthcare professionals in Norway, England, Scotland, and Ireland and used in **medical schools** around the world.

What juniors need to survive

Focusing on what's important to healthcare professionals

Speed – Find answers quickly and accurately

Actionable - Practical information for use at the point of care

Access - Access evidence easily anywhere, anytime

Assurance - Important updates, trusted clinical evidence

The problem with …
Comorbidities

> Training from **medical school** onwards, clinical teams, and clinical guidelines, however, all tend to be organised along single disease or single organ lines.

The BMJ - Rising to the challenge of multimorbidity
Chief Medical Officers for England, Wales and Scotland

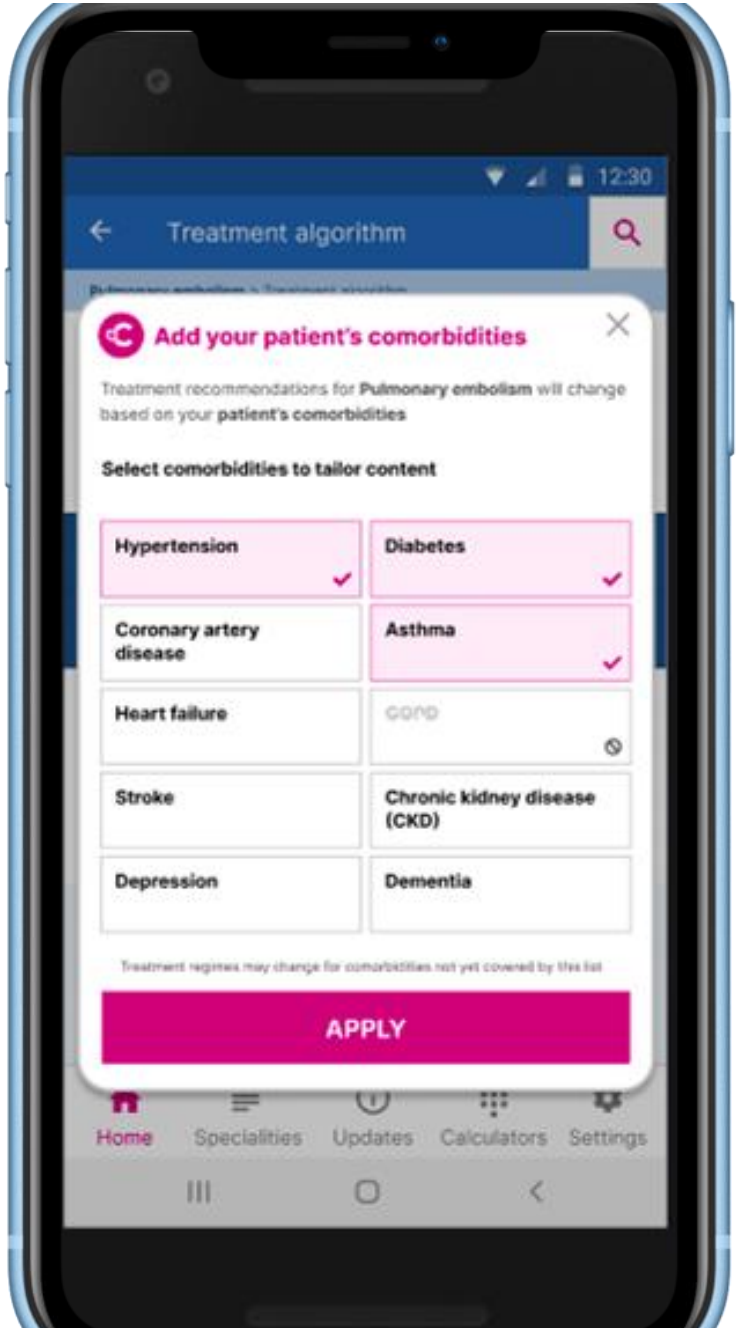
Comorbidities in the acute setting

Most patients in the acute setting have more than one medical condition, but clinical resources only focus on single conditions.

When comorbidities aren't taken into account, patients get **suboptimal care** leading to **worse clinical outcomes**. Comorbidities also associated with **longer lengths of stay**.

Comorbidities

- One in three adults suffers from multiple chronic conditions
- In the UK, one in three adults admitted to hospital as an emergency have five or more conditions
- People with multimorbidity have poorer functional status, quality of life, and health outcomes, and are higher users of ambulatory and inpatient care than are those without multimorbidity. Also higher mortality
- This all poses a significant problem for health systems
- **But resources for HCPs only focus on single conditions!**



BMJ Best Practice Comorbidities Manager

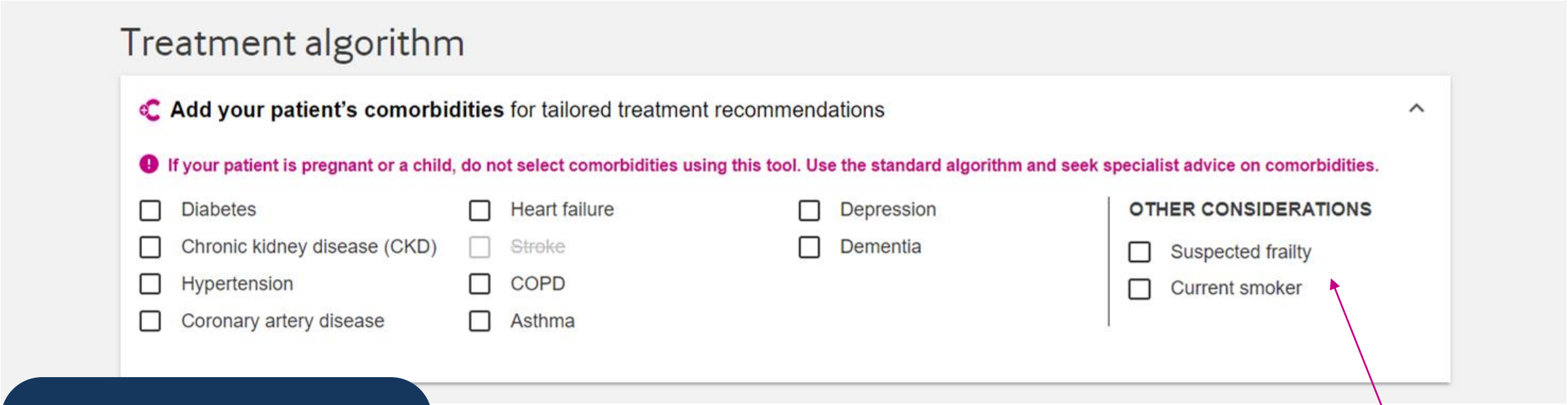
Add the patient's comorbidities to an existing management plan and get a tailored plan instantly.

Supports healthcare professionals to treat the whole patient when managing acute conditions.

Treat with confidence to improve patient outcomes.

Combinations

512
combinations per topic



38,300+
treatment algorithm combinations

The only CDS tool designed to address comorbidities

Comorbidities: task

Q

Is the issue of multimorbidity a challenge for your institution?

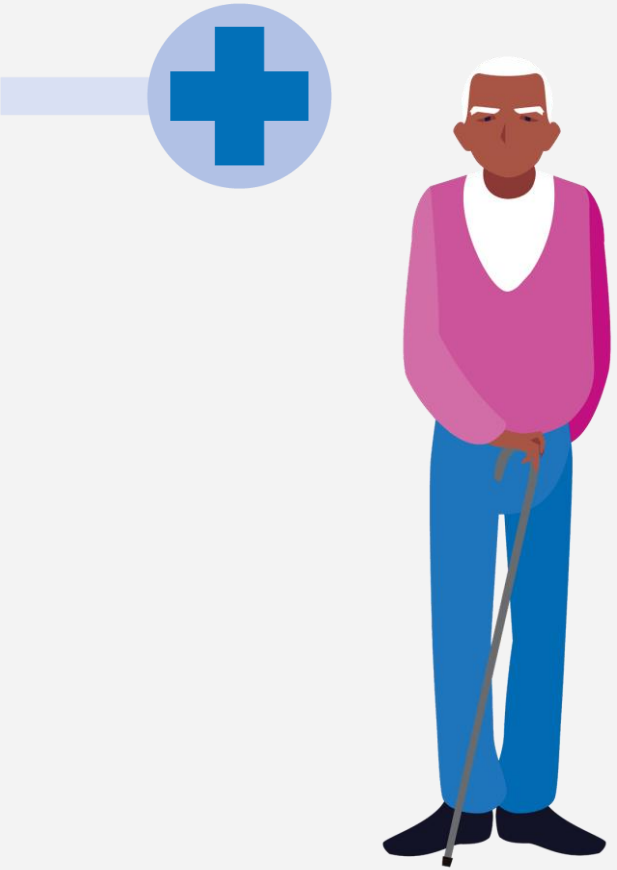
What are the main clusters of comorbidities that your patients have?

Nominate a spokesperson, take notes and report back.

Clinical scenario

Clinical scenario - Pulmonary embolism

Pulmonary embolism + chronic kidney disease



Patient presents

A 65-year-old man presents to the emergency department with acute onset of shortness of breath of 30 minutes' duration. Initially, he felt faint but did not lose consciousness. He is complaining of left-sided chest pain that worsens on deep inspiration. He has a history of **chronic kidney disease**.

Two weeks ago he underwent a total left hip replacement and, following discharge, was on bed rest for 3 days due to poorly controlled pain. He subsequently noticed swelling in his left calf, which is tender on examination.

His current vital signs reveal a heart rate 112 bpm, BP 145/85 mmHg, and an O_2 saturation on room air of 91%. CTPA confirms the clinical suspicion of **pulmonary embolism**.

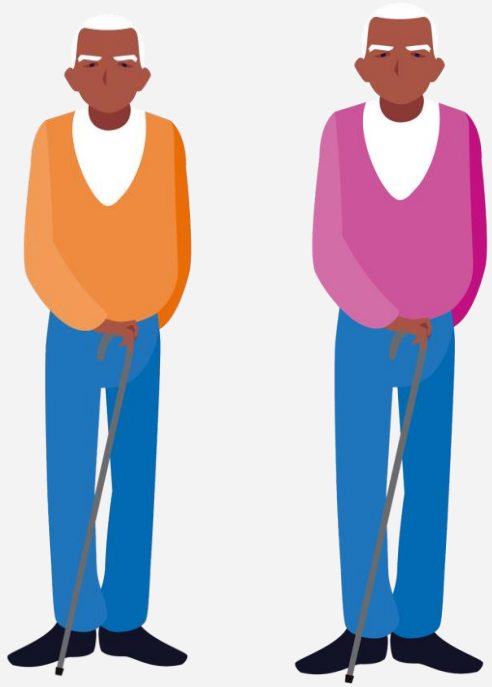
Clinical scenario - Pulmonary embolism

Pulmonary embolism + chronic kidney disease

Clinical scenario A
(Comorbidities not actively considered)

PE managed correctly but CKD missed.
Standard treatment given for PE.

- **Wrong anticoagulant chosen.**
  Increased risk of bleeding.
- **Full dose of anticoagulant started.**
  Bleeding episode.
- **Renal function not checked or monitored.**
  AKI develops.
- **Renal team called in late.**
  Patient in renal failure.



Clinical scenario B
(Comorbidities Manager used)

PE and CKD managed correctly. Patient starts to recover from PE - CKD remains well managed.

- **Correct anticoagulant chosen.**
  So reducing risk of bleeding.
- **Dose of anticoagulant adjusted.**
  Further reducing risk of bleeding.
- **Renal team informed.**
  With review if needed.
- **Baseline renal function checked.**
  At admission.
- **Renal function kept under continuous review.**

Clinical scenario - Pulmonary embolism

PE + CKD

Patient outcome

As a result of not treating the patient's comorbidities, the patient in scenario A becomes seriously unwell - with renal failure and bleeding

He is admitted to the intensive care unit and spends an additional **6 days** in hospital than the patient in scenario B (3 in a HDU bed and 3 on a normal ward).

From the patient's perspective, he has had a **prolonged hospital stay, inconvenience, bleeding, worsening of renal function, and distress.**

Clinical scenario - Pulmonary embolism

PE + CKD

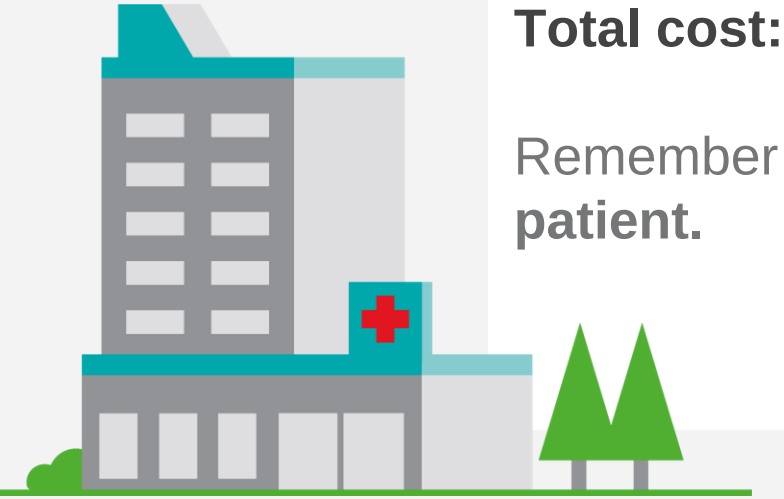
Costs

The extra cost associated with the patient in scenario A's prolonged length of stay includes:

- The number of bed days and the type of bed days
- 3 HDU bed days + 3 normal bed days

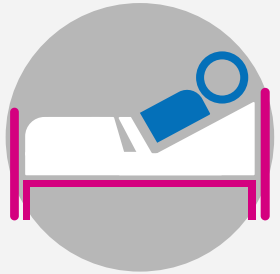
Total cost: £6,621 in UK

Remember - this is just one **comorbidity** added to **one acute condition** for **one patient.**



Clinical scenario - Pulmonary embolism

PE + CKD



The annual frequency of PE is:
527 per 100,000 with end-stage renal disease,
204 per 100,000 with chronic kidney disease and,
66 per 100,000 persons with normal kidney function.

Median length of stay is longer in patients with PE and CKD/end-stage renal disease than in those with normal kidney function.

In-hospital, PE mortality higher for persons with end-stage renal disease and CKD is significantly more ($P<0.001$) compared with persons with normal kidney function.

Comorbidities: task

Q

What have you done to tackle the challenge of patients with comorbidities so far?

How does the issue of multimorbidity present a challenge to quality improvement and patient safety?

Nominate a spokesperson, take notes and report back.

Integrating BMJ Best Practice into EHR systems

The aims of integration

- **Raise awareness** of resource as they need it
  - spending ever more time in the clinical system

- **Reduce barriers** to access
  - automatic sign in (at institution level)

- Information **in context** of clinical work
  - Searching for recommendations directly in the clinical system
  - Linking from specific entries to relevant recommendations

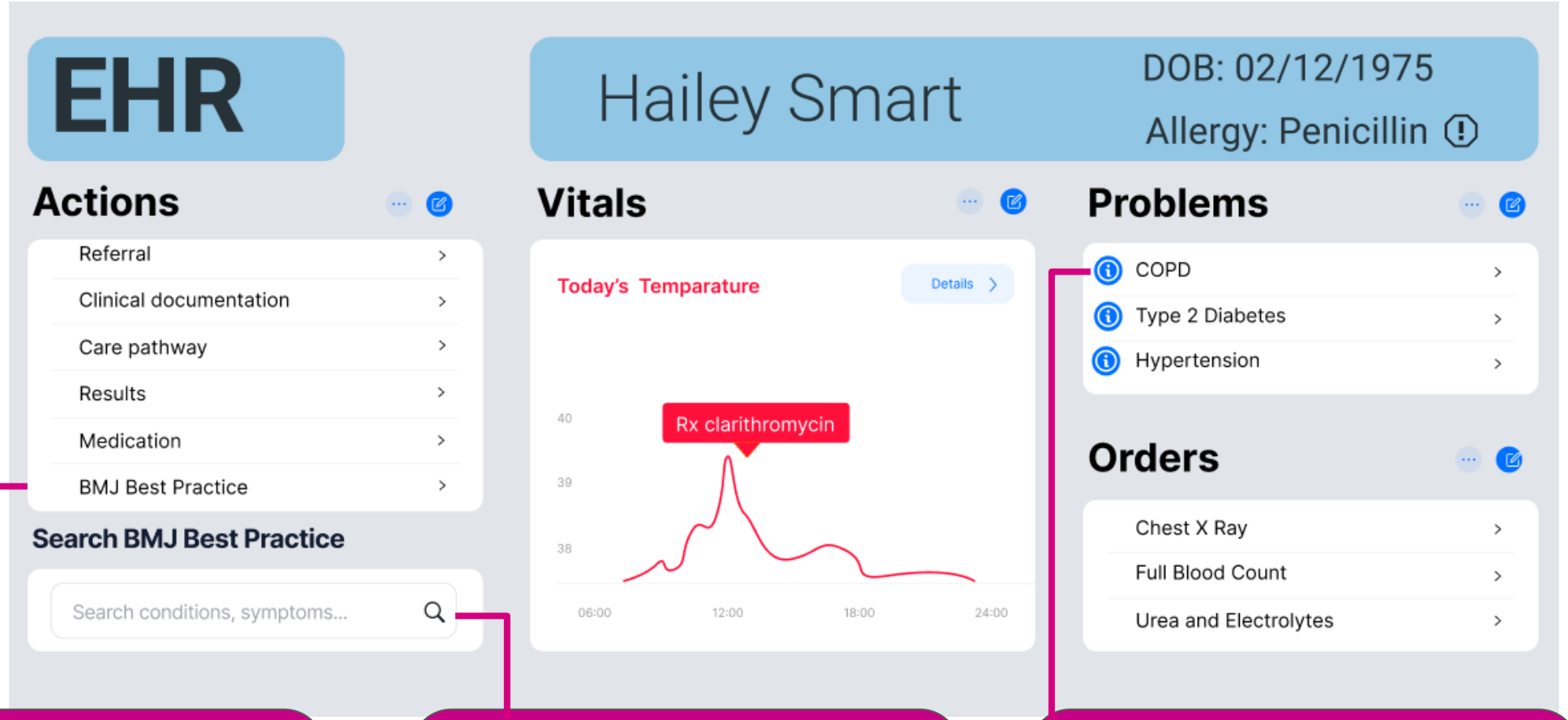
The 5 rights of EHR integration

- Right Information
- Right Person
- Right Time
- Right Channel
- Right Format

https://www.healthit.gov/sites/default/files/clinical-decision-support-0913.pdf

Integration options

Illustrative Patient Record System



Level 1: General link to BMJ Best Practice front page

Level 2: Embedded BMJ Best Practice search

Level 3: Diagnosis specific links - HL7 Infobutton

Integration of CDSS and improved care

- The CDSS integrated with BMJ Best Practice **improved the accuracy** of clinicians' diagnoses.
- **Shorter confirmed diagnosis times** and hospitalization days were also found to be associated with CDSS implementation

Tao L , Zhang C , Zeng L , Zhu S , Li N , Li W , Zhang H , Zhao Y , Zhan S , Ji H Accuracy and Effects of Clinical Decision Support Systems Integrated With BMJ Best Practice–Aided Diagnosis: Interrupted Time Series Study JMIR Med Inform 2020;8(1):e16912

Localisation

The challenge

- Many organisations also have **specific trust information** that they need their healthcare professionals to adhere to in addition to national and international guidance.

- Key local clinical information is often **stored in multiple places** and can be difficult for healthcare professionals to find

- Healthcare organisations want to ensure **consistency of care** across the trust/organisation

- Healthcare professionals want everything they need to know in **one place.**

The solution

- The local guidance tool enables healthcare organisations to **easily add links** to local clinical information to BMJ Best Practice topics
- The tool provides a **central place** for healthcare professionals to access local clinical information as well as national and international guidance
- Having key clinical information stored centrally and easily accessible supports healthcare organisations to ensure **consistency of care**
- Healthcare professionals tell us that having all this information stored centrally will enable **faster decision making**. As a result, this significantly **improves the healthcare process and ultimately, patient care**
- Increased **visibility and ease of access** of local protocol guidance.

Local information is clearly highlighted within the topics.

Gout

View PDF

OVERVIEW | THEORY | DIAGNOSIS | MANAGEMENT | FOLLOW UP | RESOURCES

- THEORY: Aetiology, Case history
- DIAGNOSIS: History and exam, Investigations, Differentials, Criteria
- MANAGEMENT: Treatment algorithm, Emerging, Prevention, Patient discussions
- FOLLOW UP: Complications, Prognosis
- RESOURCES: Images and videos, References, Patient leaflets, Evidence

Last reviewed: 16 Apr 2023

Last updated: 17 Nov 2022

Summary

Local guidelines

Trust guidance

BMJ Group (Online access from BMA House) urges you to prioritise the following local guidelines:

ACR guideline for management of Gout

Published by: American College of Rheumatology
Last published: 2020

Gout is characterised by acute onset of severe joint pain, with swelling, effusion, warmth, erythema, and or tenderness of the involved joint(s).

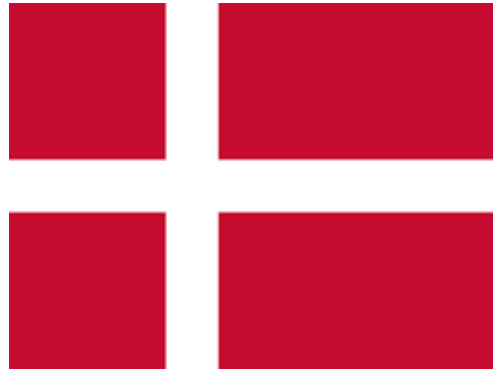
Differentials

- Pseudogout (calcium pyrophosphate deposition disease)
- Septic arthritis
- Trauma

More Differentials

Guidelines

Comorbidities in Denmark



- Friis et al conducted a study of the co-occurrence of multiple long-term conditions in people with multimorbidity in Denmark. They found that **33% of the population had 2 or more conditions**. They found a high prevalence of somatic and mental health disorders. (1)

- Schiøtz et al looked at older adults taking multiple medications. All participants had two or more chronic conditions; the **median number of conditions was 6**. The most prevalent chronic condition was heart disease (87%), hypertension (86%), dyslipidaemia (69%), chronic pain (58%), diabetes (56%), COPD (42%), and osteoporosis (39%). (2)

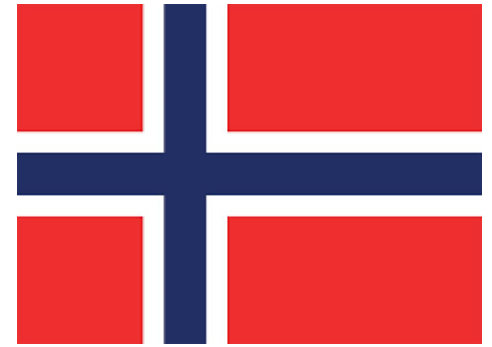
- Another study by Plana-Ripoll et al looked at mental health comorbidities. They found that **comorbidity within mental disorders is pervasive**, and the risk persists over time. (3)

Comorbidities in Sweden

- Melis et al looked at the incidence and predictors of multimorbidity in elderly people in Sweden. They found that **multimorbidity has a high incidence in old age and that mental health-related symptoms are likely predictors of multimorbidity**, suggesting a strong impact of mental disorders on the health of older people. (1)

- Ergatoudes studied the prevalence of non-cardiac comorbidities and mortality in patients with heart failure in Sweden. They found that patients with heart failure with preserved ejection fraction had a high prevalence of **hypertension, diabetes, stroke/TIA, anemia, pulmonary disease**, liver disease, sleep apnea, gout and cancer. (2)
- Dong et al looked at multimorbidity patterns of and use of health services by Swedish 85-year-olds. They found comorbidities to be common and that these tended to occur in **clusters** - including vascular, cardiopulmonary, cardiac (only for men), somatic–mental (only for men), mental disease (only for women).

Comorbidities in Norway



- In one study **39% had ≥2 multimorbid conditions** with ≥1 frailty measure, and 17% had ≥3 multimorbid conditions with ≥2 frailty measures. Multimorbidity with frailty is common, and social inequalities persist until age 80 years in women and throughout the lifespan in men.
- In another study on average, the GPs carried out 20 consultations addressing 43 different issues on a typical day in their practices. **Multimorbidity was a factor in 29 % of the consultations, mental disorders in 22 %** and stress and life strains in 18%
- In another study of stroke the patients had **4.7 chronic conditions (SD: 1.9)** corresponding to the predefined list of morbidities

Comorbidities in Finland

- A study by Husko et al on patients with heart failure in Finland showed a high prevalence of comorbidities among these patients. The **most common co-morbidities were essential hypertension (58%), chronic elevated serum creatinine (57.3%), atrial fibrillation and flutter (55.1%), and chronic ischaemic heart disease (46.4%)**. (1)

- A study by Garin et al of global multimorbidity patterns showed that Finland had a high prevalence of multimorbidity (68.25). **Multimorbidities reported included angina, arthritis, asthma, cataract, COPD, cognitive impairment, depression, diabetes, edentulism, hypertension**, obesity, and stroke. (2)

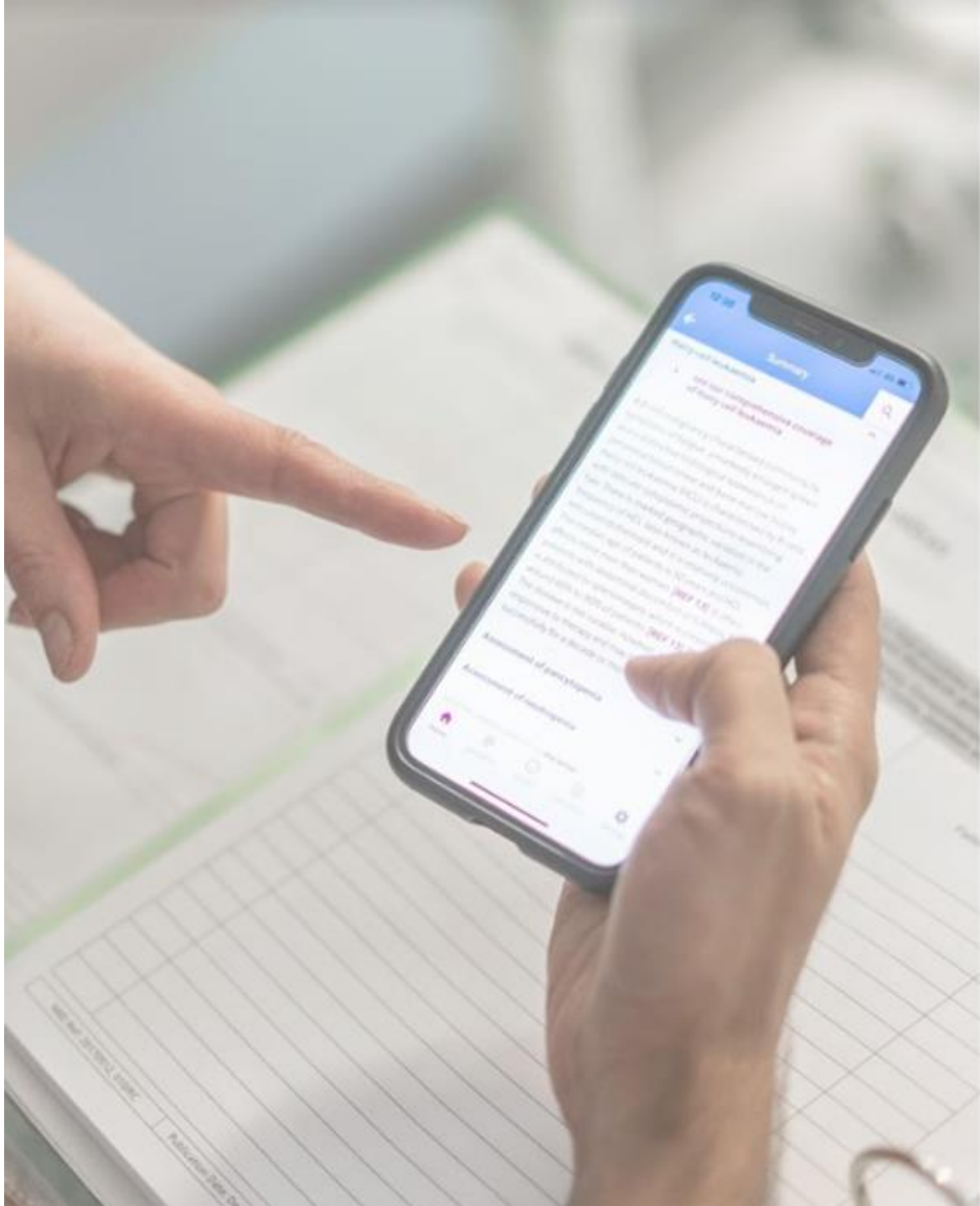
Comorbidities in England and Wales

- **59.5% of patients in England and Wales with a heart attack had at least 1 of the following long-term health conditions** at the time of their heart attack: diabetes, chronic obstructive pulmonary disease or asthma, heart failure, renal failure, cerebrovascular disease (stroke), peripheral vascular disease, or hypertension.
- Estimates of comorbidity in the community [in Wales] are consistent with previous findings: comorbidity was common, and for some conditions (e.g. COPD and osteoporosis), it was **almost ubiquitous.**

Comorbidities

- Challenges to guidelines

- Challenges to quality improvement
  - Measurement
  - Intervention
  - Ongoing measurement.



Comorbidities: task

Q

How would you use a tool like this?

What about integration of tools into your electronic patient record?

Nominate a spokesperson, take notes and report back.

“It improved the safety of the medical care he was receiving”: an impact evaluation of BMJ Best Practice Comorbidities in the management of patients with multiple conditions

We asked a cohort of junior doctors to use the BMJ Best Practice Comorbidities Manager in their actual clinical practice. We then asked them to fill in a simple questionnaire outlining what difference, if any, the tool made to their practice.

The evaluation showed that BMJ Best Practice Comorbidities is effective at **helping junior doctors to improve the care that they provide to patients with multiple conditions and that it does have an impact on patient care**.

When it doesn’t change practice, it can still have an effect by reassuring junior doctors that their practice is correct.

Evaluation of BMJ Best Practice Comorbidities in the management of patients with multiple conditions - impact on doctors

"The tool was very useful in this lady mentioned, where a difficult decision had to be made regarding safe anti-platelet therapy for her acute coronary syndrome but also in the presence of suspected GI [gastrointestinal] bleeding (although she was haemodynamically stable with no significant drop in her serum haemoglobin). The tool helped me **rationalise my choice of agent**."
Specialty Doctor in Acute Medicine

"It helped me to consider the co-morbidities instead of having **tunnel-vision** towards the acute disease process." "His systolic blood pressure was 88, however looking back in clinic letters this was his norm and I was able to stop the IVT he had running." "This improved our care as the fluid may have worsened the situation if left to continue."
Junior doctor / resident

"While I was confident of the management of his co-morbidities, the tool helped to maintain a **holistic approach** to his care."
Specialty Doctor in Acute Medicine

"A good reminder to review asthma medications and ensure optimal medications; additionally there was a prompt to review **the patient's mental health** which was useful (depression), particularly when substance misuse was involved."
Junior doctor / resident

"The treatment algorithm with the co-morbidities app showed the importance of early **input from the diabetic team**, especially as the patient was nil by mouth."
Surgical Trainee / resident

Evaluation of BMJ Best Practice Comorbidities in the management of patients with multiple conditions - impact on cost

“After checking BMJ Best Practice, the patient was started on intravenous antibiotics as a patient in primary care. A **hospital admission of one or two days was avoided**.”
Junior doctor, NHS London

“BMJ Best Practice was used to apply Duke's criteria to patients which enables risk stratification for timings of transthoracic echo (TTE]. A high risk patient was identified and **expedited for TTE**. Los [length of stay] reduced by 24 hours."
Junior doctor, University Hospitals Coventry and Warwickshire NHS Trust

“Use of BMJ Best Practice therefore allowed me to **avoid presentation to hospital**.”
Junior doctor, Manchester University NHS Foundation Trust

“Saved **unnecessary admission** of the patient into hospital for 48-72 hrs which usually happens for such scenario.”
Junior doctor, NHS England

“Prompt investigation and treatment allowed minimal disruption to the patient’s care and their psychotropic medication. It allowed them to remain within the mental health setting and **prevented an admission to the acute medical trust**.”
Junior doctor, NHS England

Evaluation of BMJ Best Practice Comorbidities in the management of patients with multiple conditions - impact on patients

"It improved the **safety of the medical care** he was receiving."
Junior doctor / resident

"Allowed a more **patient-centred approach** and encouraged exploration of patient wishes."
Junior doctor / resident

"This will help **shorten the hospital stay** of the patient."
Surgeon in Training / resident

"Ensured that the patient did not have diabetic-related complications and allowed **the team** to be more aware of the management."
Junior doctor / resident

"Following the guidance on the treatment of the acute condition alongside the pre-existing comorbidities, the team was able to get a definite plan from day 0 and the patient was immediately allocated to the most appropriate ward, thus improving the quality of care, shortening the hospital stay and having a **better experience overall**."
Senior House Officer / resident

The voice of patients

“I’ve had a number of health concerns recently, it’s been one thing after another. A good healthcare professional for me is one who puts me at ease, listens and really hears, is genuinely empathic, thinks about what is going to work for me and is not dismissive of my opinions. Honesty regarding their knowledge and ability to refer to others is also vital.”

BMJ Best Practice

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