

CHOOSING AN ONLINE CLINICAL
DECISION SUPPORT RESOURCE



A checklist for purchasers

Using this checklist

This checklist is designed to help you compare clinical decision support tools by suggesting features, metrics and benefits on which to base a comparison. The answers given in this document relate to *Best Practice*, a new decision support tool from the BMJ Evidence Centre.

The questions you should ask

- 1 How would you describe your product?
 - 2 How does your product help a busy clinician?
 - 3 How does your product help a medical student?
 - 4 What types of information do you include within your product, and why?
 - 5 Do you have patient information?
 - 6 How many diagnoses do you cover?
 - 7 Does your product include any patient case histories?
 - 8 What type of drug information do you cover?
 - 9 How much coverage does your product have for emerging treatments?
 - 10 Does your product contain differential diagnosis information?
 - 11 How do you help practitioners to interpret diagnostic tests?
 - 12 What is your coverage in primary and secondary care?
 - 13 Does your product cover any co-morbidities?
 - 14 How often is your information updated and reviewed?
 - 15 Is your product international?
 - 16 Can your product be customised?
 - 17 What inbound and outbound linking does your product support?
 - 18 How do you put your product together?
 - 19 What is your peer review process?
 - 20 How do you structure the information within your product?
 - 21 How many images does your product contain?
 - 22 How is the evidence in your product produced?
 - 23 How can I assess the quality of the evidence you present?
 - 24 How systematically do you review the literature?
 - 25 What if there is no evidence for a condition, or if it is poor quality?
-

1 How would you describe your product?

Best Practice is not a textbook or a journal. It is a “born-digital” tool that has been designed from the ground up to make it quick and easy to find clinical answers at the point of care.

Each topic has a consistent structure including a summary and definition, key diagnostic steps and tests, treatment approaches with drugs, guidelines and evidence, and recommendations for patient follow-up. Easy navigation means you don’t have to scroll through pages of text – you can access exactly the information required quickly. (See “how do you structure information within each topic?”)

Our aim is always to provide the clinician with the piece of information they need, with the least possible effort required from them. Specifically, *Best Practice* is very efficient at answering clinical questions while at the same time minimising the amount of reading a clinician needs to do to find that answer (see “How does *Best Practice* help a busy clinician?”).

2 How does your product help a busy clinician?

Firstly, we only present information that we think is relevant. We are more selective than textbooks about the type and volume of information we produce, because we are focussed specifically on answering clinical questions at the point of care.

Secondly, we have designed the *Best Practice* website and the functionality within it to be intuitive and consistent so that it is quick and easy for clinicians to use. Much of the information we provide is presented in lists that can be quickly scanned by experienced clinicians, and need only be expanded when more detail is required. Junior doctors or those seeking information outside their core knowledge base can quickly expand list items to review the subject in more depth, including background information and research references. (See “how do you structure information within each topic?”).

Thirdly, we present treatment information by patient population so that clinicians don’t have to waste time reviewing the breadth of potential treatments, and need only review details relevant to their current patient.

More generally, we search for, assess and synthesise information from a wide variety of sources and present it in a unified, concise and clinically-applicable format in order to save clinicians’ time.

3 How does your product help a medical student?

Best Practice helps students to familiarise themselves with decision support tools at an early stage of their career. It acts as a reference tool that can anticipate and answer questions that will arise during clinical rotations or desk-based revision. The integration of *Clinical Evidence* within *Best Practice* provides students with the best available evidence and can help them to understand the importance of applying an evidence-based approach.

The intuitive design of information within *Best Practice* and the step-by-step guidance through treatment options and over 10,000 diagnoses gives students easy-to-use but effective support as they begin to make clinical decisions. Integrated reference links, clinical evidence and links to the appropriate drug database aid onward research, while the site's comprehensive image bank aids understanding, assessment, diagnosis and treatment.

4 What types of information do you include within your product, and why?

Our approach to clinical content is to use well-considered information formulae to guide the selection and use of different information types (randomised data, observational data, expert opinion, guidelines, etc) all of which are appraised for quality and clinical importance. The end result of this process is a composite clinically-useful monograph aimed at influencing a clinician's management approach, and maximising the quality of patient care.

5 Do you have patient information?

Yes. *Best Practice* includes 180 patient leaflets covering common conditions and procedures. Each handout summarises the same information contained in the related *Best Practice* topic, but in language more suitable for the general public.

6 How many diagnoses do you cover?

Best Practice contains information relating to over 10,000 diagnoses, more than 3,000 diagnostic tests and over 4,000 diagnostic and treatment guidelines.

Each topic is centred on a key diagnosis but also includes information relating to all the important differential diagnoses and complications.

- Some topics will include more differential diagnoses and complications than others but on average there are 10 diagnoses per topic.
- Some differential diagnoses and complications include more information than others. Because *Best Practice* is specifically designed for point of care use, we aim to minimise the amount of reading a clinician has to do to find a clear answer to a clinical question.

7 Does your product include any patient case histories?

Every *Best Practice* condition monograph has one, or more usually several, case histories relating to the disease covered by that monograph. These histories, or vignettes, serve to illustrate what the expert author team considers to be a classical, or otherwise important, presentation of that disease. For a healthcare practitioner not familiar with the disease in question, these histories serve as an invaluable, and very practical, guide in the initial diagnostic process. For those already familiar with the disease management, the case histories are an important reminder of less usual presentations.

8 What type of drug information do you cover?

Best Practice is seamlessly linked to a complete and up-to-date drug information database; in the UK, this is the BNF while international users are linked to Martindale. Both products provide full prescribing information for recommended drugs, including nomenclature, cautions, contra-indications, side-effects, dosage, interactions and prescribing in special populations (e.g. during pregnancy or alongside renal complications).

The BNF contains accurate, relevant and current information on all drugs commonly prescribed in the UK. It is updated every 6 months, and consulted 3 million times a week in the UK.

Martindale contains information on over 146,000 preparations of 5,827 drugs. It details administration and uses in 42 countries, including generic drug name, common abbreviations, international language variants, chemical names and 'street' names. It also provides information about unlicensed and experimental uses.

9 How much coverage does your product have for emerging treatments?

Best Practice authors are internationally renowned in their areas of clinical expertise. As a consequence, they are ideally placed to identify and describe new and emerging treatments in their clinical specialty. Every *Best Practice* topic has a section which relates directly to emerging treatments (where these exist) and their inclusion in *Best Practice* will be of practical help to healthcare practitioners at the point of care.

10 Does your product contain differential diagnosis information?

Yes. We provide detailed and interlinking differential diagnosis information, wherever this is appropriate, to help practitioners consider a patient's symptoms and signs in the broadest possible terms before focussing on a specific diagnosis and management plan. In each case, differentiating tests are indicated.

11 How do you help practitioners to interpret diagnostic tests?

All of our extensive diagnostic test information is presented in a clinical context to ensure that interpretation of test results is made as practical and as efficient as possible. Tests are described in a logical stepwise order where this is possible, and detailed information is presented about how to interpret, and react to, both positive and negative test results.

12 What is your coverage in primary and secondary care?

All of our content is relevant to primary care, and to specialist care (secondary, tertiary, quaternary, etc.) for specialists in training in the relevant subject areas, and to specialists who are asked to interact in some way with diagnoses outside their area of immediate specialist interest.

13

Does your product cover any co-morbidities?

Best Practice describes in detail the management of patients with more than one disease. This management involves not only the treatment of these increasingly common patients, but also their initial investigation and diagnosis, as well as their follow-up. The global elderly population is the most frequent population for co-morbid disease states and is increasing rapidly in number; in this context, it is essential for clinical decision support tools such as *Best Practice* to provide clear, practical advice on co-morbidity management.

14

How often is your information updated and reviewed?

Best Practice is continually reviewed and updated throughout the year. All content is updated at least once a year, and new content is added regularly (for example, 705 new topics were added between February and September 2009).

15

Is your product international?

Best Practice has a large number of international contributors (authors and peer reviewers), and its content has been specifically written for the global community; for example, drug names and units are international (rather than specific to the US, as is the case with many existing clinical decision support tools). It is edited by a team skilled in producing international content, and the expertise, research evidence, and information at the core of *Best Practice* is clinically applicable worldwide.

Fundamental diagnostic tests and treatment principles remain the same irrespective of geography, and *Best Practice* is integrated with an appropriate drug database for the customer's location (BNF in the UK and Martindale throughout the rest of the world). Guidelines from a wide variety of different countries and geographic areas are included [technology to provide number of international guidelines], and *Best Practice* can be customised at a national, regional, or institutional level to allow local content, such as practice guidelines, to be added where appropriate.

The website navigation is available in 17 languages. When there is considerable interest in a particular language, our editorial strategy is to translate the key elements of *Best Practice* (such as the overview, diagnosis, and treatment sections) that will answer the majority of clinical questions.

16

Can your product be customised?

Best Practice contains a number of features that allow users and institutions to customise the product for their own use. The 'Notes' feature allows users to annotate individual pages within a *Best Practice* article with their own notes and save them for future reference. The 'Add to Learning plan' feature allows users to bookmark content into their BMJ Learning CPD 'Plan and Record'. These customisations can all be managed in 'My *Best Practice*', which also allows users to save searches or bookmark articles, enabling easy access to the content that matters to them most.

Institutional or regional administrators can also make customisations across a wide group of users. For example, you can upload links to local or national guidelines for management of particular conditions, so that country- or hospital-specific advice can be integrated within our general content. Institutional

administrators can also configure their link resolver, to provide users with context-sensitive OpenURL links, and can upload a logo that will reaffirm the institution's role in providing and endorsing *Best Practice*.

17 What inbound and outbound linking does your product support?

Each page within *Best Practice* has unique stable links which can be posted onto an intranet to support deep linking directly to specific content. Outbound reference links are OpenURL compliant and can link via a link resolver to the institution's preferred full text version.

18 How do you put your product together?

Our in-house team of clinical editors is made up of experienced doctors and pharmacists. This team is responsible for thoroughly assessing all submitted text and ensuring quality, consistency, and clinical accuracy across *Best Practice*. Our robust editorial process includes detailed peer review of each article (see "what is your peer review process?"), pharmacist drug information verification, and technical quality assurance steps, in addition to a multi-stage sign-off process.

Newly submitted articles are peer reviewed by at least two external expert clinicians. We consider feedback a crucial tool for evaluating the information we publish, and for improving the way our articles are presented and distributed. All user feedback is managed by one of our senior editors. Urgent problems are dealt with immediately, and other suggestions are considered for incorporation during our regular updating cycle.

Our editorial process for *Best Practice*:

1. Expert author commissioned
 2. In-house guideline and evidence search presented to author (see "how systematically do you review the literature?")
 3. Clinical editor works with author during the writing stage
 4. Author submits first draft of topic
 5. Draft is peer reviewed by at least two international experts (see "is *Best Practice* international?")
 6. *Clinical Evidence* systematic review or other high quality research evidence is combined with the topic and evidence scores added where the evidence exists (see "how do I know the quality of the information you present?")
 7. Edited in-house by a clinical editor who is a qualified clinician
 8. All drug recommendations clinically checked by a qualified pharmacist
 9. In-house review by a senior clinical editor
 10. A further quality assessment by another senior clinical editor
 11. Copy edited by an in-house medical editor
 12. Proofread by an independent proofreader
 13. Published on a test website
 14. Final version checked by the author before going live
 15. Web and functionality checks by a clinical editor
 16. Signed off for publication by the senior editor
 17. Published online
 18. Feedback gathered and assessed immediately
 19. Topic updated regularly (see "how often is your information updated and reviewed?")
-

19 What is your peer review process?

Newly submitted articles are peer reviewed by at least two external expert clinicians. In order to create content applicable to an international audience, we ensure a mix of authors and peer reviewers from different global regions for each topic.

20 How do you structure the information within your product?

We present three different types of topic:

Conditions

Each condition topic provides comprehensive, detailed information on a specific condition or group of conditions. It covers all aspects of disease management, including treatment.

Assessments

Each assessment topic presents information on how to evaluate a symptom (e.g. chest pain), sign (e.g. peripheral oedema) or diagnostic test results (e.g. metabolic acidosis). A "Step-by-Step" approach to diagnosis allows the reader to make a clear differential diagnosis assessment, and to select from this the most likely single diagnosis to guide initial and further management. Details of individual differential diagnoses are provided to allow the reader to consider clinical findings in light of the most likely differential diagnosis.

Overviews

Each overview topic provides a general synopsis on a group of conditions: for example, Acute coronary syndrome. It provides introductory information that can include background, pathophysiology, history and evaluation. Conditions within the topic, for example unstable angina, ST elevation myocardial infarction and non-ST elevation myocardial infarction, are listed with links to individual topics. Links to *Clinical Evidence* systematic reviews are provided for relevant and available topics. References, relevant images and credits are presented.

Within each topic, we break information down into steps that reflect the patient consultation. A comprehensive but easy-to-navigate menu allows you to move quickly through the information to find the answer you need.

Highlights

- Summary: key highlights on the topic present the essential facts.
- Overview: history and exam factors, diagnostic tests and patient groups with treatment types are listed to provide a brief synopsis of diagnosis and treatment.

Basics

- Fundamental information on the topic is provided in the definition, epidemiology, aetiology, pathophysiology and classification.

Prevention

- Primary and secondary prevention are discussed. Information on population screening is provided for applicable topics.
-

Diagnosis

- This section guides the user through the process of diagnosis addressing history and examination, including risk factors, and diagnostic tests, before elaborating on any possible differential diagnoses.
- The Step-by-Step (diagnosis) section leads the reader through a verbal algorithm of the approach to diagnosis.
- Guidelines appropriate to diagnosis of the condition are listed from international and regional organisations. The reader can also upload further guidelines from their local institutions.
- Case histories describe one or two classical patient presentations and may also discuss other less common presentations.

Treatment

- Details on treatment of the condition are provided according to well-defined patient groups. Treatment is tiered according to primary, secondary and tertiary options as well as adjunctive or add-on treatments. Comments provide salient information regarding the treatment type, and medications are listed with dosing and administration details. Links to online medical formularies allow the reader to click through to more information on dosing, availability, formulations, side effects and contraindications. Currently, Martindale is available to rest-of-world readers and British National Formulary to UK readers.
- The "Step-by-Step" (treatment) section is a verbal algorithm on approach to treatment and may also provide additional information on specific treatment types or medications. It provides an overview of how to treat the condition.
- Emerging treatments are discussed and may include those still undergoing trials or those that may have been approved for use, but are not yet widely used.
- Treatment guidelines appropriate to the condition are listed from international and regional organisations. The user can also upload further guidelines from their local institutions.
- Summaries of the current research evidence, where available, are provided throughout the treatment and diagnosis "Step-by-Step" sections in the form of evidence pop-ups. Readers have the opportunity to link to a systematic review of the evidence on the *Clinical Evidence* website or to other articles or systematic reviews. Research evidence in the form of *Clinical Evidence* systematic reviews and GRADE evidence quality assessment tables are provided in the Evidence page.

Follow-up

- Recommendations, complications and prognosis are discussed.
-

Resources

- References are listed, with key references highlighted. References have abstract and/or full text links where these are available.
- Images are presented within the image library and can also be found as image tags providing a pop-up image within the text of the topic, particularly in the diagnosis section. Inline images will appear in full within the text. (See “how many images does *Best Practice* contain?”)
- Online resources appropriate to the topic may be listed. These link to, for example, organisations providing further information on the condition, and useful resources used in diagnosis such as patient questionnaires or algorithms.
- Patient leaflets from *Best Health* are provided for relevant and available *Best Health* topics.
- Credits list the author and peer reviewer details.

21**How many images does your product contain?**

Where appropriate, we include clinical images and relevant diagrams within the core content of a topic, and list these separately under the resources menu. *Best Practice* contains about 2,500 images, which are used to explain visual clinical issues and to illustrate important clinical procedures. Images are presented within the image library and can also be found as image tags that provide a pop-up image within the text of the topic, particularly in the diagnosis section. Inline images will appear in full within the text. Images include photomicrographs, endoscopic photographs, radiographs, ECGs, ultrasounds, CT scans, MRI scans, x-rays, diagrams and photographs of surgical and clinical procedures.

22**How is the evidence in your product produced?**







The biomedical evidence provided to support statements in *Best Practice* comes from two sources.

Firstly, an extensive medical literature search forms the backbone of every *Best Practice* topic and is carried out by our team of highly skilled in-house Information Specialists. The results of this search are then processed using a double appraisal process. The initial round of appraisal is by the Information Specialist team and focusses on factors such as study type, and key quality parameters usually including trial size, blinding, allocation concealment, losses to follow up, and so forth. In the subsequent appraisal by our expert author team, the results of the first quality appraisal are reviewed and further refined for relevance and clinical importance. The expert author team then uses the results of this process to guide and structure the topic.

The topic and its evidential basis are reviewed in detail by the independent peer review and editorial teams. The editorial team work as an integral part of the BMJ Evidence Centre, a world recognised leader in the production of evidence-based medical literature. The BMJ Evidence Centre also produces *Clinical Evidence*, the global evidence based medicine resource used by over 1,000,000 physicians worldwide.

Secondly, more than 50% of the topics within *Best Practice* incorporate systematic reviews from *Clinical Evidence*. These reviews are world-renowned for their academic quality and clinical relevance. They are produced using an extensive collaborative approach involving the large in-house BMJ Evidence Centre Information Specialist and Editorial teams, the expert subject author teams, and the independent expert peer review teams. Recommendations for treatment and prevention incorporate the best clinical evidence available reflecting the current state of knowledge and uncertainty for each condition.

Our evidence is categorised by effectiveness as follows:

Intervention	Icon	Description
Beneficial		For which effectiveness has been demonstrated by clear evidence from systematic reviews, RCTs, or the best alternative source of information, and for which expectation of harms is small compared with the benefits.
Likely to be beneficial		For which effectiveness is less well established than for those listed under "beneficial".
Trade off between benefits and harms		For which clinicians and patients should weigh up the beneficial and harmful effects according to individual circumstances and priorities.
Unknown effectiveness		For which there are currently insufficient data or data of inadequate quality.
Unlikely to be beneficial		For which lack of effectiveness is less well established than for those listed under "likely to be ineffective or harmful".
Likely to be ineffective or harmful		For which ineffectiveness or associated harm has been demonstrated by clear evidence.

23 How can I assess the quality of the evidence you present?

For key categorical statements in the topic, the BMJ Evidence Centre team applies specific evidence links with formally graded categorisations along with specific evidence summaries (Table 1 and image 1). This categorisation is based on the GRADE system, which synthesises evidence type, quality, consistency among studies, direct applicability, and effect size.

Table 1: Evidence Grades

Grade	Quality of evidence	Description
A	Good	<ul style="list-style-type: none"> • Good quality randomised controlled trials (RCTs) of >200 participants in total for the comparison, or • Good quality systematic reviews (SRs) of good quality RCTs
B	Medium	<ul style="list-style-type: none"> • Randomised controlled trials (RCTs) of <200 participants, or • Methodologically flawed or conflicting RCTs of >200 participants, or • Good quality systematic reviews (SRs) of methodologically flawed RCTs, or • Methodologically flawed SRs, or • Good quality observational (cohort) studies
C	Poor	<ul style="list-style-type: none"> • Poor quality observational (cohort) studies or • Methodologically flawed or conflicting randomised controlled trials (RCTs) of < 200 participants in total for the comparison, OR • Interventions listed in <i>Clinical Evidence</i> for which <i>Clinical Evidence</i> found no evidence that met <i>Clinical Evidence</i> inclusion criteria (observational or case control studies will exist but will not meet <i>Clinical Evidence</i> inclusion criteria).

Image 1: Evidence score

The screenshot shows the Best Practice website interface for 'Myocardial Infarction, ST-Elevation'. The page includes a navigation menu with categories like Highlights, Basics, Prevention, Diagnosis, Treatment, Follow Up, and Resources. The 'Treatment approach' section is highlighted, and an 'Evidence Score' pop-up window is overlaid on the text. The pop-up states: 'Mortality: there is good-quality evidence that aspirin reduces mortality, reinfarction and stroke at 1 month compared with placebo in people with acute MI. Evidence Level A Systematic reviews (SRs) or randomized controlled trials (RCTs) of >200 participants. More info from BMJ Clinical Evidence'.

Evidence grades are frequently based on evidence from *Clinical Evidence*, a global leader in evidence-based healthcare, and all authors are sent relevant *Clinical Evidence* reviews as part of their literature search results. Consequently, the world-renowned evidence process which underlies *Clinical Evidence*, also underlies the evidential component of *Best Practice*. Evidence scores may also be based on high quality systematic reviews not produced by *Clinical Evidence* which have been selected by the rigorous double appraisal process (see "How is the evidence in your product produced?")

All of our expert author and peer review teams are granted full editorial independence, and are required to disclose any competing interests. Biomedical evidence in *Best Practice* is routinely updated to reflect recent clinical advances using a process of continuous literature surveillance, scheduled periodic topic restructures, and urgent updates in response to key items of breaking research.

24 How systematically do you review the literature?

The systematic process by which we search and appraise the literature that informs *Best Practice* content is described below. Note that reviewing literature systematically does not in itself create a systematic review. For this reason, we uniquely include within *Best Practice* the comprehensive range of systematic reviews from *Clinical Evidence* (for more information about how *Clinical Evidence* content is produced, see http://clinicalevidence.bmj.com/ceweb/about/put_together.jsp).

1. Search for systematic reviews for areas not covered by *Clinical Evidence*:
 - Search for systematic reviews on the topic on Medline / Embase / Cochrane Library / Database of Abstracts of review of Effectiveness (DARE; if appropriate)
 - Limit the search to English language only
 - Limit the search to systematic reviews published within the last four years
 - Search for systematic reviews for areas already covered by *Clinical Evidence*
 - Check the search date of the published *Clinical Evidence* systematic review
 - If *Clinical Evidence* search date is within the last year no additional systematic review search is required
 - If *Clinical Evidence* search date is older than one year perform a search for subsequent systematic reviews
2. Search for Guidelines:
 - Using the National Guidelines Clearinghouse website <http://www.guideline.gov/>, perform a search for guidelines on the topic
 - Search using MeSH terms or free-text.
3. Search for AHRQ Research Reviews:
 - <http://effectivehealthcare.ahrq.gov/index.cfm>
 - Browse by specialty or keyword search. Include a link to the full text in the search results
4. *Best Practice* OVID Medline Search filter for systematic reviews.
5. *Best Practice* Embase filter for systematic reviews.

What if there is no evidence for a condition, or if it is poor quality?

Much of the available global medical research data is focussed on a relatively small subset of diseases. This is one of the reasons why we combine a variety of information types, including expert opinion and guidelines, to provide practical, authoritative answers that can be of real use at the point of care in the vast majority of diseases (see “What types of information do you include within *Best Practice*, and why?”). Where randomised evidence is available and appropriate we include it either in the form of a *Clinical Evidence* systematic review, or as references within the *Best Practice* text. Where non-randomised forms of evidence are more appropriate or where there is no randomised evidence available, we include whichever information type is most suitable to help guide clinicians’ management decisions. We take care to grade the evidence we present so you can assess its validity (see “How do I know the quality of the evidence you present?”)
