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Special Article

Surgery and opioids: evidence-based expert consensus guidelines on the perioperative use of opioids in the United Kingdom

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Summary

There are significant concerns regarding prescription and misuse of prescription opioids in the perioperative period. The Faculty of Pain Medicine at the Royal College of Anaesthetists have produced this evidence-based expert consensus guideline on surgery and opioids along with the Royal College of Surgery, Royal College of Psychiatry, Royal College of Nursing, and the British Pain Society. This expert consensus practice advisory reproduces the Faculty of Pain Medicine guidance. Perioperative stewardship of opioids starts with judicious opioid prescribing in primary and secondary care. Before surgery, it is important to assess risk factors for continued opioid use after surgery and identify those with chronic pain before surgery, some of whom may be taking opioids. A multidisciplinary perioperative care plan that includes a prehabilitation strategy and intraoperative and postoperative care needs to be formulated. This may need the input of a pain specialist. Emphasis is placed on optimum management of pain pre-, intra-, and postoperatively. The use of immediate-release opioids is preferred in the immediate postoperative period. Attention to ensuring a smooth care transition and communication from secondary to primary care for those taking opioids is highlighted. For opioid-naive patients (patients not taking opioids before surgery), no more than 7 days of opioid prescription is recommended. Persistent use of opioid needs a medical evaluation and exclusion of chronic post-surgical pain. The lack of grading of the evidence of each individual recommendation remains a major weakness of this guidance; however, evidence supporting each recommendation has been rigorously reviewed by experts in perioperative pain management.

Keywords: anaesthesia; analgesia; opioids; opioid use disorder; pain; perioperative pain; post-surgical pain; practice guidelines

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Editor's key points

- Persistent postoperative opioid use after surgery is a significant public health concern.
- Strong perioperative stewardship is needed to address inappropriate opioid prescribing without affecting pain control.
- Opioids need to be judiciously prescribed before, during and after surgery.
- Prehabilitation is required for complex pain patients with close working between In-hospital and chronic pain services, including referral to a pain specialist where necessary and formulation of a perioperative plan.
- Development of a transitional pain service model is recommended.

Opioids are widely used for perioperative analgesia.[1] The post-surgical use of opioids may be an important source of problems, particularly in the USA.[2] Concerns related to opioid use are primarily death attributable to overdose[3] and other morbidity, such as addiction and falls.[4–7] There is a 64% increase in all-cause mortality (hazard ratio: 1.64) in patients who take long-term opioids.[8] Although the opioid misuse problem has not been quantified in the UK, there are concerns that its trajectory mirrors that in the USA.[9] For example, in England, opioid prescriptions increased by 34% between 1998 and 2016.[10]

Prolonged opioid use after surgery is a significant concern, as this increases the chances of misuse and opioid-related patient safety issues.[11,12] Persistent postoperative opioid use (PPOU) is defined as the use of opioids 90 days after surgery in preoperative opioid-naive patients. For those on opioids before surgery, any increase in baseline opioid use 90 days after surgery would be classified as PPOU. Persistent postoperative opioid use occurs in 0.6–26% of opioid-naive patients and is 35–77% for those taking opioids before surgery.[12,13] Concerns surrounding PPOU have led to calls for rational perioperative opioid management[14] and greater display of opioid stewardship by perioperative clinicians including anaesthesiologists, surgeons, and general practitioners amongst others.[15,16]

In September 2018, the Faculty of Pain Medicine (FPM) at the Royal College of Anaesthetists (RCoA; London) commissioned a multi-professional working party to develop a whole system guidance on the best practice relating to use of opioids perioperatively.[17] The developed guidance is presented here.

Target population

The primary population of interest is all patients undergoing surgery (both major and minor). This includes both opioid-naive patients and those taking opioids before surgery.

Target users for this guidance

This document represents the work of a multi-professional and multidisciplinary collaboration, and sets out guiding principles in opioid management in the perioperative period. This guidance is intended for use by clinicians, nurses and allied healthcare providers, patients, pharmacists, and policymakers. Clinicians involved in perioperative care (anaesthetists, surgeons, pain nurses, general practitioners, and mental health practitioners) may use this guidance to inform their practice on the use of perioperative opioids. Readers are signposted to the relevant evidence that underpins this consensus guidance.

Guidance/practice advisory development

The FPM and the RCoA board laid down the terms of reference for the project working party in September 2018. The project working party (expert group) was tasked to develop policy and guidance on opioid prescribing in the perioperative period that was to include advice on preoperative, intraoperative, and postoperative discharge on opioid management, including care transitions from the hospital to primary care. Additionally, the working group was asked to consider opportunities for opioid de-escalation of preoperative and postoperative opioids and treatment of chronic post-surgical pain.

The working party membership and corresponding members included representatives from the FPM, Royal College of General Practitioners (RCGP), Royal College of Surgeons of England (RCS), British Pain Society (BPS), Royal College of Nursing (RCN), and Royal College of Psychiatry (RCP). A lay person representative from the RCoA reviewed and commented on the draft consensus statements. The details of the FPM terms of reference for this guidance may be found in Supplementary Data 1. The included institutions were requested to nominate an expert in opioid prescribing in the perioperative period. The experts involved were individuals with substantial experience in management, research, teaching, or policy analysis of opioid prescribing in the perioperative period. The diverse membership of the working party was intended to have as wide an input as possible to create guidance that was inclusive of all care transitions or stakeholders for the surgical patient. The expert group reviewed existing research evidence and clinical practice guidelines before arriving at a consensus.

Over 3 yr (2018–20), the working group performed a series of guidance appraisal (four Delphi rounds) with the same group of experts. The first round was a face-to-face round and the rest were by e-mail. Once a consensus was reached on all sections of the guidance, the experts took this guidance back to the respective bodies (partner institutions RCoA, RCGP, RCS, RCP, RCN, and BPS) that had nominated them. The partner institutions then fed back comments to the working group, which were discussed amongst the working group and a consensus reached. Once the final document was finalised, the expert working group reappraised the document. The lead authors of the working group moderated the consensus process. Disagreements were resolved using group e-mail discussions followed until a consensus was reached on a particular issue. The final draft document was then hosted online on the FPM website for public consultation for a month. We received feedback from 43 respondents that were discussed by the expert working group and incorporated into the final guidance.

The rapid review revealed that the evidence base consisted of mostly observational studies and expert opinion/advisories/guidelines; hence, a formal grading of each recommendation was not performed by the working party for this guidance. Previously published guidance on allied issues (e.g. buprenorphine) has reported a similar evidence base.[18] We have, however, highlighted the low grade evidence base (per the Oxford Centre for Evidence-Based Medicine [CEBM])[19]

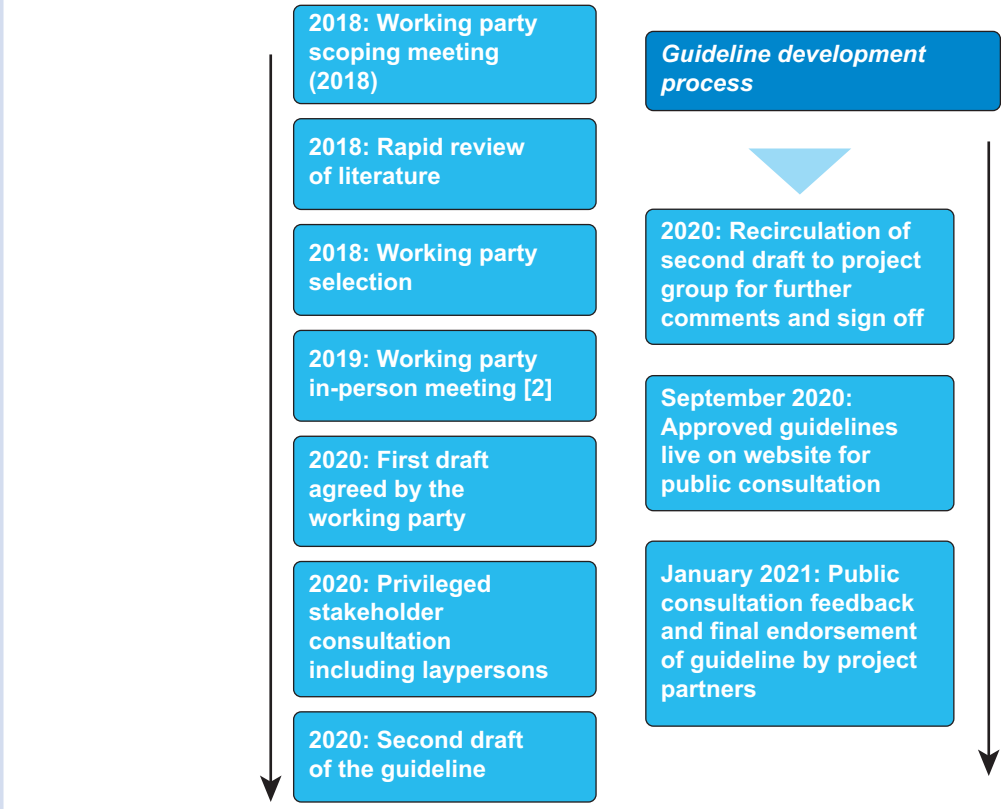

Fig 1. Guideline development process.

available for the working group's recommendations alongside the headings for each section.

The available evidence was collated, and expert opinion consensus resulted in the development of this whole system pathway for using opioids rationally in the perioperative period. The guidance development process is shown in Fig. 1.

Clinical guidance (practice advisory)

The detailed recommendations are as follows.

Preoperative recommendations (Oxford CEBM[19] level 2b-5 evidence: cohort studies, case series, and expert opinion)

Action: anaesthetists, surgeons, general practitioners, and other healthcare professionals

(i) Preoperative assessment

Preoperative assessment for patients with complex pain problems should include an assessment of pain and current consumption of analgesic drugs, including opioids. Ideally, it should focus on a biopsychosocial assessment of pain, as outlined in the FPM guidelines.[20–23]

(ii) Prehabilitation

a. Consideration should be given to reducing preoperative anxiety and catastrophising,[24] as this may have value in improving post-surgical outcomes, including pain.
b. Preoperative counselling must include working collaboratively with the patient[25] and expectation management regarding opioid use and perioperative pain management. A patient information leaflet should be provided.
c. Patients with complex pain needs who may benefit from an extended stay in the PACU should be identified so that appropriate plans can be formulated.

(iii) Complex pain cases (preoperative recommendations for opioid-tolerant patients)

a. For patients with complex pain problems who are prescribed high opioid doses, the opinion of a pain specialist[25] should be gained before surgery.
b. A useful way to assess preoperative opioid consumption is through calculation of the oral morphine equivalent (OME)[26] dose, which should be documented in the clinical record.
c. Opioid tolerance (decrease in pharmacological response) and opioid-induced hyperalgesia (increase in pain perception) may occur in patients taking opioids. Opioid tolerance is likely at OME doses of 60 mg day^{-1} for $\geq$7 days.[27,28] Avoid escalating opioid doses before surgery.
d. If the oral route is unavailable immediately after surgery, opioid conversion should be made to parenteral morphine.[26,27]
e. Prehabilitation (optimisation before surgery) should include optimal management of preoperative pain and optimisation of opioids and other pain/adjuvant medicines. In selected cases, weaning of opioids should be considered before surgery.[29,30]

f. In patients unsuitable for preoperative opioid de-escalation, opioids taken before surgery should usually be continued throughout the surgical admission.
g. An individualised plan should be made for patients on buprenorphine (sublingual or transdermal patches) or methadone, and in other specific situations, such as pregnancy.[31]
h. Opioid-sparing adjuncts should be considered when managing pain before surgery.

(iv) Perioperative management plan
a. A perioperative pain management plan should be formulated with the patient and communicated to the surgical and anaesthetic team. The patient should be warned that the plan may need to be altered.

Summary of preoperative recommendations

Prehabilitation (optimisation before surgery) should ensure optimal management of preoperative pain, including opioid prescribing, psychological preparation, education, and expectation management. All healthcare professionals involved in perioperative care should collaborate to provide the highest standards of patient-centred care, including opioid stewardship. Opioids should be used judiciously by healthcare professionals. This means using opioids when necessary, but stopping opioids when they are no longer required. Patients should be screened for chronic pain and opioid use in the preoperative period. Opioid weaning should be considered before surgery if feasible. The OME dose per 24 h of prescribed opioids should be noted. Referral to a pain specialist should be considered in complex cases. A perioperative management plan should be formulated with the patient and communicated to the surgical and anaesthetic team.

Intraoperative recommendations (Oxford CEBM[19] level 2b-5 evidence: cohort studies, case series, and expert opinion)

Action: anaesthetists and surgeons

(i) Intraoperative nociception management as a component of balanced anaesthesia should follow the principles of
a. Promotion of early return of usual function (i.e. drinking, eating, and mobilisation)[32]
b. Multimodal analgesia, which has been shown to be opioid sparing, and to provide superior pain relief.[33–35]
c. Opioid-sparing analgesia techniques and use of opioid-sparing adjuvants are encouraged.[36]

(ii) Procedure Specific Postoperative Pain Management (procedure-specific analgesic techniques) recommendations for analgesia should be used rather than over-reliance on the WHO analgesic ladder.[37]

(iii) Anti-nociception management techniques as a component of a balanced anaesthesia technique need to be individualised, considering patient choice, type of surgery, comorbidity, and pre-existing medicines. This should be based on shared decision-making with the patient.

Summary of intraoperative recommendations

Intraoperative nociception management as part of a balanced anaesthesia technique should include multimodal analgesia and opioid-sparing analgesic techniques. Evidence-based procedure-specific analgesic techniques should be used when evidence is available. Perioperative anti-nociception techniques must be tailored to individual patients. This should be based on shared decision-making, considering the type of surgery, patient comorbidities, and pre-existing medicine use.

Postoperative recommendations (Oxford CEBM[19] level 2b-5 evidence: cohort studies, case series, and expert opinion)

Action: anaesthetists, surgeons, and other healthcare professionals

Goals

(i) The goal of postoperative pain management is to minimise postoperative pain and to provide a seamless transition of analgesic care from operating theatre via recovery (PACU) to the ward.

(ii) Goals of pain management must be matched to the type of surgery and to the stage of recovery (e.g. after a laparotomy, the immediate goal is the ability to cough and breathe deeply, but in subsequent days it is to facilitate mobilisation).[38]

(iii) Postoperative pain assessment and pain management strategies must promote return of normal function (i.e. drinking, eating, movement, and mobilisation).[32]

Recommendations for the PACU

(i) Optimisation of pain relief before leaving the PACU

Pain assessment in the PACU should take function into account. A pain assessment that involves functional assessment (i.e. pain on breathing or movement) along with awareness of factors, such as anxiety, that can increase pain perception is recommended.

One example of function-related pain scores is the functional activity score,[39]
where
A is no limitation of (relevant) activity attributable to pain,
B is mild limitation of activity attributable to pain, and
C is being unable to complete activity attributable to pain.

(ii) Managing patients with complex pain problems in recovery
a. Opioid-tolerant patients may require additional interventions in the PACU to facilitate optimal pain management. These interventions should be planned and documented as far as possible so that a simple reliance on using opioids for pain relief in recovery/PACU is avoided.[40] In patients with complex pain problems, increased pain intensity taken in isolation should not be a sole indicator to administer additional opioids. A comprehensive pain assessment is needed. Repeated elevated pain intensity scores should trigger further assessment and experienced input. Increased pain intensity score should not be a sole indicator for a delay to discharge from PACU. When patients report severe pain, empathy and active listening should be provided.

Recommendations for the ward

(i) Promote return of normal function.
   a. The oral route should be used as soon as possible for administration of medicines.
   b. It must be realised that increased pain intensity may be a consequence of surgical complications (e.g. compartment syndrome or anastomotic leak).
   c. Sedation scores should be recorded in addition to ventilatory frequency to detect those at risk of opioid-induced ventilatory impairment.[41–46]

(ii) Immediate-release opioids are preferred in the management of postoperative pain when simple analgesics are insufficient to achieve the analgesic goals. If modified-release opioid preparations (including transdermal) are used, due care should be exercised, as they have been associated with harm.[47] The prescribed dose of immediate-release opioids should be age related (rather than weight) and considers renal function. Liquid oral morphine at a concentration of 10 mg (5 ml)$^{-1}$ is the preferred opioid, as it is a Schedule 5 drug in the UK, which facilitates more timely administration. Immediate-release oxycodone is not recommended as a first-line opioid, as it is a Schedule 2 drug and is more labour intensive to administer. However, it is recognised that in elderly patients over 70 yr old or in patients with renal failure, other opioids may be used postoperatively in preference according to local policy.

(iii) When analgesic requirements are reduced, a reverse analgesic ladder is recommended: wean opioids first, then stop NSAIDs, and then stop paracetamol (acetaminophen).

(iv) The inpatient pain service should be involved in the post-surgical care of the opioid-tolerant patient.[48] Inpatient psychology input may be needed to manage these patients.[49,50]

(v) Patients on gabapentinoids should be identified and the indications reviewed.[51] Gabapentinoids should be tapered if no longer indicated.

Discharge planning

(i) Patients should be informed on how to self-administer opioids safely.
   a. On discharge, patients should be informed how to self-administer opioid medicines safely, wean analgesics, and dispose of unused analgesic medicines. Patients should be reminded to take particular care with storing opioids and other medicines that may be liable to misuse. They should be told of the dangers of driving or using machinery while taking opioid medicines, and a patient leaflet should be provided to reinforce these messages.[52]

(ii) A protocol for discharge medicines should be used, as it reduces subsequent opioid use.[12,53–56] Patients should have access to appropriate simple non-opioid analgesics.
   a. It is preferable to prescribe opioid and non-opioid analgesics separately to allow for dose changes of individual analgesics.
   b. Patients should be encouraged to keep a record of analgesics taken, as research has shown that this results in better pain control.[54]
   c. New prescriptions of modified-release opioid preparations (including transdermal patches) should be avoided without specialist consultation. If specialist consultation is required, a key feature of this consult would be to exclude chronic post-surgical pain.

(iii) The hospital discharge letter should be provided in a timely way to all healthcare professionals caring for the patient, including community pharmacists, to avoid an acute prescription of opioids inadvertently becoming a repeat prescription. The hospital discharge letter must explicitly state the recommended opioid dose, amount supplied, and planned duration of use. The opioid treatment plan should be agreed with the patient (see Medicines and Healthcare products Regulatory Agency guidance on opioids).[56]

(iv) Guidance should be given about medicine review after discharge from hospital.
   a. Usually 5 days and no more than 7 days of opioids (including tramadol) should be prescribed.[54]
   b. The hospital discharge letter must explicitly state the recommended opioid (including tramadol) dose and duration.

Additional recommendations for opioid-tolerant patients

(v) De-escalation of opioids after pain-relieving surgery
   a. For opioid-tolerant patients whose surgery was pain relieving (e.g. knee surgery), the discharge letter should provide advice on any further weaning of analgesics taken before surgery. Secondary-care outpatient pain services or transitional pain services may be able to assist if difficulties arise.[57,58]

Post-discharge management

Action: surgeons, general practitioners, and other healthcare professionals

(i) Patients must be guided and informed to dispose of unused opioid medicines safely to avoid both diversion and subsequent inappropriate use. Safe disposal must involve taking excess supplies of medicines to the community or hospital pharmacy. Postoperative opioids must not be added to a 'repeat' prescribing template. They should only ever be added to the patient's record as an acute medicine and must be reviewed at each issue by the prescriber.[59]

(ii) If a patient not usually on long-term opioids is still taking opioids (including tramadol) 90 days after surgery and is still in pain, this should trigger further assessment in primary or secondary care, which may include referral to a pain service for investigation of persistent pain after surgery or sometimes to a substance misuse service.[60–62]

(iii) Patients on gabapentinoids should be identified and the indications reviewed.[51] Gabapentinoids should be tapered off if no longer indicated.

(iv) Pain-related and opioid-related readmissions should be notified to the inpatient pain team.[63]

For a summary of postoperative recommendations, see Fig. 2. Pain relief should be optimised before leaving the postoperative recovery area (PACU). For patients with complex pain problems, elevated pain intensity taken in isolation should not be a sole indicator for administration of further opioids and should not hinder discharge to the ward. Holistic pain assessment is recommended. Postoperative pain assessment and pain management strategies must promote

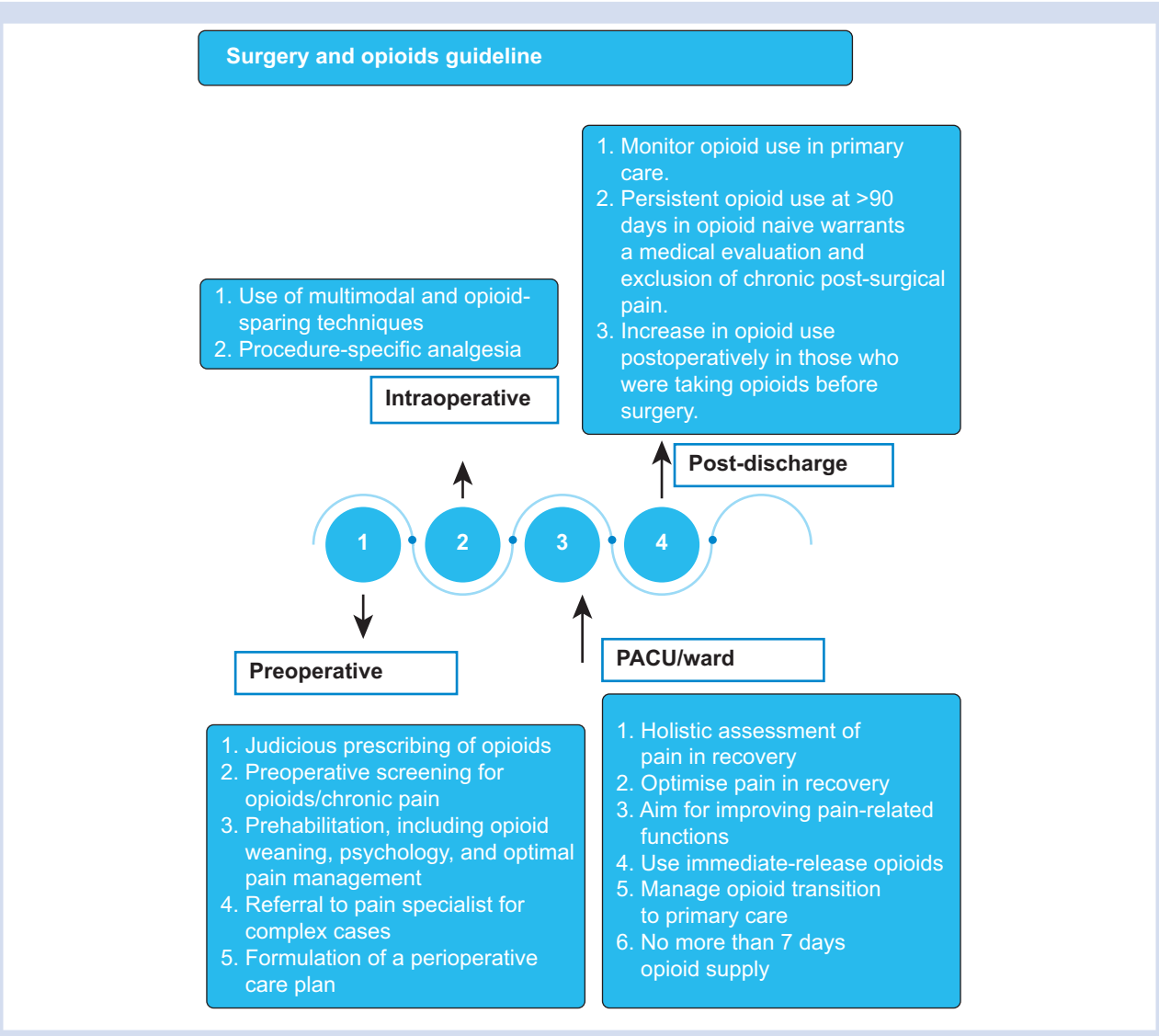

Fig 2. Key recommendations.

return of normal function (i.e. drinking, eating, movement, and mobilisation). Do not treat according to pain intensity, but to improve function and mobility. Immediate-release opioids are preferred in the management of postoperative pain (to decrease risk of respiratory impairment and long-term continuation) when simple analgesics, such as paracetamol or NSAIDs, are not effective enough to allow achievement of agreed functional goals. On discharge, patients must be told how to self-administer medicines safely, wean analgesics, and dispose of unused analgesic medicines and told of the dangers of driving while taking medicines. A patient leaflet should be provided to reinforce these messages.

Some painful conditions, such as osteoarthritis of the knee, may require surgical procedures to treat pain and improve function. Patients with these conditions may be taking opioid medicines before surgery. These opioids should be gradually withdrawn, where possible, after surgery. Local protocols for the prescription of discharge medicines after surgery should be developed to minimise the chances of subsequent inappropriate opioid use. Ideally, this should be managed between the hospital and primary care. The hospital discharge letter must explicitly state the recommended opioid dose, amount supplied, and planned duration of use. Guidance should be given about necessary medicine review after discharge from hospital. Usually 5 days, and no more than 7 days, of medication should be prescribed.

Limitations and future directions

This is an expert-based consensus guidance (practice advisory) using the best available evidence on the topic. Although this may be viewed as inferior in the hierarchy of evidence because of paucity of high-grade evidence, the 'expert consensus based on evidence' of an expert panel has been

shown to have real-world applicability in clinical practice.[64,65] Perioperative pain interventions are often 'complex' and are made up of a number of active ingredients or components that interact with each other and other factors to bring about an emergent change to outcomes, and are considered to have inherent heterogeneity.[66] The lack of grading of the evidence of each individual recommendation remains a major weakness of this guidance, although supporting evidence is quoted for each recommendation and the recommendations and underlying evidence have been rigorously reviewed by experts in this field.

This guidance is a pragmatic synthesis of available evidence on this topic presented in a practical way. One of the challenges faced was how to handle 'indirect evidence' or evidence regarding opioid use from other health systems. The experts had to use their judgement in assessing the direction, magnitude, and applicability of the data before applying them within a guidance meant for the UK. The panel consensus was reached in a phased, deliberate, systematic, and transparent manner (Fig. 1).

In the future, a few questions need to be answered:

(i) What is the population impact of surgical opioid prescribing on the long-term use or misuse of opioids in the UK?
(ii) What is the population burden of patients with chronic pain problems who are taking opioids and require surgery in the UK?
(iii) Do patients with chronic pain problems who are taking opioids and presenting for surgery need more healthcare input, experience more complications, and have poor outcomes?
(iv) What is the best method of prehabilitation for patients with chronic pain problems who are taking opioids before surgery?
(v) What is the best time and method of opioid de-escalation before and after surgery?
(vi) Does intraoperative opioid use influence long-term persistent post-surgical pain and opioid use?

We understand the heterogeneity of health systems (structure and delivery) worldwide. Outside of the UK, the principles of this guidance should be applied keeping in mind unique local healthcare system characteristics and resources available.

Authors' contributions

Conceptualisation/design/rapid review/forming of working group for the guideline: DS, PW
Structure/content formulation: DS, PW
Generation of content/ideas/critiques: SH, MR, RB, RK, NL, SC
Collection of expert comments: DS, PW
Guidance revision: DS, PW
Disagreement resolution: DS, PW
Commentaries and content contribution: JH, DL
Writing of paper: DS
Revision/production of final paper: all authors
Approval of paper: all authors

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Declarations of interest

The authors declare that they have no conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bja.2021.02.030.

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