NHS England

Cardiovascular Kidney Metabolic (CVKM) Toolkit: Secondary Care Settings

This toolkit, developed by a subgroup of NHS England's Renal and Cardiac Clinical Reference Groups, provides a framework to support the development of location agnostic, specialty led cardiovascular kidney metabolic (CVKM) services in acute care settings.

It draws on evidence and emerging practice from systems implementing more integrated approaches to care for people with coexisting heart failure, chronic kidney disease, diabetes, and obesity, and outlines optional principles across pathway design, multidisciplinary team working, medicines optimisation, workforce, and the patient journey.

The toolkit is intended to support providers, networks, and systems wishing to implement more integrated CVKM care in secondary settings.

It is non-mandatory, carries no dedicated national funding, and is designed for local adaptation, enabling use in line with system priorities, capacity, and commissioning arrangements.

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One person, one pathway: the case for integrated specialty-led CVKM care

Managing multiple long-term conditions (MLTC) requires integrated care pathways, particularly for people living with both heart failure (HF) and chronic kidney disease (CKD). Around half of the UK's one million people with HF also have CKD, while one in five with CKD have HF. The prognostically significant guidelines directed medical therapies for HF and CKD are comparable: ACE inhibitors, SGLT2 inhibitors and mineralocorticoid receptors. These slow CKD progression, reduce heart failure hospitalisation, and lower cardiovascular mortality. Optimising treatment for one condition therefore benefits the other, supporting a case for integrated HF–CKD care for efficient cross-specialty medicines optimisation.

Despite the proven kidney benefits of HF therapies, 79% of documented reasons for non-initiation or withdrawal relate to exaggerated renal concerns: mainly CKD, risk of acute kidney injury, and high blood potassium. Since withdrawal or non-optimisation of HF therapies worsens outcomes, involving kidney specialists in integrated care can ensure greater use of prognostically important drugs without requiring additional appointments. Moreover, several agents beneficial to both HF and CKD, such as Finerenone and sodium zirconium cyclosilicate, are currently limited to nephrologist initiation.

Undercoding of CKD in primary care also hinders optimal therapy. Many patients have CKD noted in HF clinic letters but not in primary care records, indicating that HF services play a further unrecognised role crucial role in early CKD detection and management.

Diabetes coexists in more than a third of people with both HF and CKD. The same therapies noted above also reduce cardiovascular and kidney risk in diabetes. A similar prevalence and association with poor outcomes in HF and CKD is seen with obesity, also a major factor in diabetes onset, and emerging evidence shows that weight management therapies improve both heart and kidney health.

These observations support the concept of cardiovascular-Kidney–Metabolic (CVKM) syndrome as a single disease entity, and the calls for more integrated guidelines and care delivery that span previously separated specialist clinics. The traditional operating model of non-interacting different specialty clinics addressing different facets of that same entity is inefficient for supporting these highest risk patients in a holistic manner, i.e. HF and kidney disease, with or without diabetes and obesity. Moving away from siloed working also represents an opportunity to deliver more consistent messaging and offer a single point of contact for patients, to offer access to clinical trial recruitment, and to educate the next generation of health care professionals.

Early and preventative CVKM intervention in primary care requires close collaboration with specialist services. Even with optimal management, some patients will progress to advanced disease, warranting specialist-led care. This creates a CVKM care model which encompasses the full spectrum of health outcomes and locations. Successful specialist CVKM services in certain regions already use cross-specialty multidisciplinary teams (MDTs), typically HF specialist nurses and nephrologists, trained in CVKM management. These flexible models enable patients to see the most appropriate clinician for their immediate needs.

The hub and spoke model of renal services risks imbalance in service delivery at different hospital and community sites, which necessitates integrated care hubs at each locality to overcome this.

The following toolkit provides a framework for development of location agnostic specialty-led CVKM services.

Principle	Recommendation/Action	Resources (links)
Principle 1: Multi-disciplinary, cross-specialty care in a dedicated clinic. **A – Referral and triage** A specialist-led, advanced cardiovascular-renal-metabolic (CVKM) clinic should provide comprehensive cross-specialty, advanced therapeutic optimisation in one place for people living with heart failure and chronic kidney disease, with or without metabolic conditions including diabetes and obesity. This will sit alongside primary care-based initiatives that focus on prevention and early intervention. Patients will typically fit the criteria for follow up in at least one of heart failure or nephrology specialist clinics. However, CVKM clinics require open referral criteria to accommodate the complex needs of people living with multiple long term conditions (MLTC), as well as specialised services as per NICE referral criteria for cases not suitable for management in primary care.	**Referral Criteria:** CVKM service referral criteria should accommodate the complexities of managing MLTC which may fall outside of usual scope referral criteria for single organ clinics. Referrals should be based on potential patient benefit, even if standard criteria are not met.	NICE MLTC
	Triage and Advice & Guidance: CVKM services should offer specific triage paired with advice and guidance (A&G) to provide timely response to referrals and queries. Where relevant, triage of referrals to CVKM clinics from primary, community and secondary care should include an immediate response advising interim strategies for medicines optimisation whilst a clinic appointment is awaited. This will limit delays in therapeutic interventions whilst waiting.	 Cost-effectiveness of implementing an advi
	Proactive case identification: Many CVKM patients are not known, sub-optimally coded, or previously discharged on suboptimal therapies. Services should use available shared care records to proactively screen for candidate patients rather than waiting solely for referrals. Patients in multiple specialty clinics should be offered consolidated CVKM care. Services should also work with relevant stakeholders at local or regional level to assist with identification of patients and prevalence through improved coding.	https://www.ahajournals.org/doi/10.1161/CIR.0000000000001184
	Subspecialty care: Access to subspecialty areas of each CVKM team should not be compromised by having follow up in a CVKM space (e.g. devices such as CGM / HCL clinics, arrhythmia clinics, advanced kidney care). In settings where CVKM optimisation is required alongside other subspecialty therapies, follow up planning should be co-ordinated between teams and with the patient to avoid clustering of appointments, and to ensure that each visit provides maximal value (e.g. bloods monitoring and medicines titration). In some situations, the CVKM service may only need to operate in an advisory capacity, e.g. to patients under advanced kidney care services (AKCS).	Example NICE TA314
	Patient-centred care: Patients and carers should be involved in decisions on access to care: right time, right person, right place. Patients should be able to raise concerns regarding their health through an agreed first point of contact, supported by access to their shared care record.	NICE NG917
	Health equality assessment: Impact assessments should begin from the point of referral, and proceed throughout service delivery. Considerations should include which patients have greatest need, how this was identified (or not), whether this is different for individuals within that group or a need to tailor the service for equal benefit (access, cultural and linguistic adaptation, shared decision making and how information communicated, patient transport costs, voluntary sector linkage). As services are offered who uses them and who gets most benefit from them?	Gov.uk health equality assessment tool

Principle	Recommendation/Action	Resources (links)
Principle 1: Multi-disciplinary, cross-specialty care in a dedicated clinic. **B - process** Managing multiple optimisation pathways in a single clinic ensures efficient use of resources, and prevention of duplication of work and conflicting plans that may occur with follow up in multiple siloed specialty clinics. This reduces appointment burden, achieves more coherent and consistent prescribing, and creates a stable point of contact for referrers and patients. Using fewer drugs to address multiple treatment targets is also a priority for CVKM patients who are faced with high prescription charges and "information overload" and side effect burden of polypharmacy. Ultimately this improves patient experience and outcomes.	**Local care:** CVKM clinic location may vary according to local service configuration but should be held at the closest possible locality to the patient. Community clinics are preferred to hospital clinics, and appointments at Renal hub centres for patients from out-of-area should be avoided. Appointment type (e.g. virtual or in-person) and time of day should consider the needs of patients.	NHSE case study MRC clinic
	Mitigating against fragmented care: Care for MLTC can be fragmented so should be effectively co-ordinated between primary care and specialised services, and with support services such as palliative care. Processes and follow up pathways should be agreed with key independent specialties i.e. Vascular to avoid duplication, maximise capacity across services and to reduce the burden of healthcare visits on patients. A standardised clinic pro-forma should ensure consistent documentation across providers and specialties, while facilitating clear communication of clinical decisions, follow-up plans, diagnostic codes, and responsibilities**.**	NICE NG56 NHS spec com roadmap
	Using data for continuous service improvement: CVKM leads should conduct (or commission) high quality service evaluation including analysis of unplanned hospitalisation rates and mortality, access time to first appointment, medicines optimisation. This should include assessment of equity of these aspects of care. Means to highlight inefficiencies in follow up co-ordination should be included in service improvement programmes.	AQUA AKI example
	Personalised planning: the complexity of discussions and the needs of patients will differ. Appointment duration should accommodate this. Considerations include the need for interpreters, access and mobility requirements, the need for counselling of therapies, and the burden of co-morbid factors including mental health diagnoses.	NHSE translation NHSE mental health
	Single visit, single person: CVKM clinic staff will include doctors, nurse specialists, and pharmacists from cardiology and nephrology backgrounds. Each clinic session should have representation from each speciality but adhere to the principle of one lead practitioner per patient visit. As a general approach, the decision on who should conduct each appointment for each patient can be made at their previous visit depending on what their priority needs are. This approach ensures that the development of CVKM clinics *increases* overall service capacity in cardiology and nephrology, and DOES NOT require additional workforce.	Example model

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Principle 2: **Medicines optimisation.** Rapid, effective optimisation of guideline-directed medical therapy (GDMT) is associated with improved long term cardiorenal outcomes and is the primary goal of a CVKM service. CVD risk reduction extends to other therapeutic areas such as lipid-lowering therapy (LLT), and also requires nuance for complex cases and advanced frailty. Clinics will ensure fewest therapies are used to address multiple treatment targets.	**Access to coherent GDMT strategies to improve CVKM outcomes:** Optimisation should include full cardiovascular risk evaluation, assessment and access to NICE approved therapies. As well as heart failure and CKD therapies (below), this will include including lipid lowering therapy, antiplatelet therapy, anticoagulation, glycaemic and metabolic therapies including GLP1 based pharmacotherapy, and additional blood pressure control aligned with NICE guidance and other relevant guidance such as ESC. Weight management, smoking cessation, psychosocial support and physical rehabilitation should be delivered as necessary, in conjunction with primary care services.	NICE Medicines optimisation  Rationale2.docx
	Choosing the right medicines: CVKM clinic prescribers should be aware of the differences in indication and comparative or additive benefit of drugs within each class and between drug classes used in CVKM therapy. Primarily this will be ACEi / ARB / ARNI, MRA and SGLT2i but should also be extended to potassium binders, beta-blockers, loop and thiazide diuretics, lipid-lowering therapy, antiplatelets, GLP1 based pharmacotherapy, antihypertensives and anti-diabetic drugs.	NICE NG203 NICE NG28 NICE NG106
	Shared decision-making: Patients and carers should be involved in decisions on medicines optimisation strategies. They require clarity on sick day rules and point of contact where multiple stakeholders are involved in care. Clinicians must agree and communicate thresholds for drug dose down-titration, dose holding, up-titration and re-initiation. Measures to avoid polypharmacy and limit the cost of prescriptions for patients must be at the forefront of optimisation strategies.	 White-paper-_Heart-Failure-An-Inconvenie
	Information sharing: Processes should be in place to ensure rapid dissemination of information on all medicines changes and changes to laboratory results and physiological parameters, to allow decision making based on the most up to date information. Depending on local use, this may extend to remote monitoring via continuous glucose monitoring, pacing device monitoring, or patient recording of physiological parameters (weight, blood pressure) and symptoms.	NHSE digital maturity

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Principle 3: **Shared decision-making and responsibility.** Complex MLTC care requires individual patient nuance. Patients are traditionally managed across multiple primary care and specialised service teams creating duplication of work and investigations.	**Defined care pathways:** There should be a clear definition of what CVKM care is, who the key local stakeholders are and how care is to be delivered across multiple organisational and geographic boundaries. Standard referral processes such as urgency based on NTproBNP levels should be accommodated but not limit access for patients who are high risk without these.	GIRFT
	Clinical accountability: Multi-specialty care of complex disease risks creating a vacuum of overall clinical responsibility, necessitating a robust governance framework for CVKM services, including a named clinical lead for each specialty.	Leadership framework
	Interoperable infrastructure: Information technology (IT) infrastructure may be fragmented on a regional level. Services should consider procedures to crosscut multiple healthcare providers e.g. hub & spoke model of renal care, primary care and specialised services, multiple laboratory information management systems (LIMS) and clinical records. Services should also have access to shared care records and relevant imaging.	NHS shared care records
	Patient engagement: Service delivery should include empowerment of patients via access to resources on self-care and polypharmacy. Important charities can provide additional support and guidance (e.g.: Pumping Marvellous, Kidney Care UK). Patient feedback covering standard patient reported outcome and experience measures (PROMs and PREMs) benchmarks should be used to monitor service impact for patients.	Kidney PREM HF PROMs

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Principle 4: **Multi-disciplinary team (MDT) meetings** With appropriate clinician expertise, MDT meetings after every clinic are not required. However, access to wider team discussion must be available for complex decision making as early intervention can change the trajectory of CVKM patient cardiorenal outcomes. Robust rapid communication is pivotal to successful and safe medicines optimisation. Patients' clinical status and medicines regimen can be expected to change frequently requiring effective information sharing.	**Collaborative discussion:** Regular in-person MDT meetings (e.g. hybrid face-to-face & online, once per month) should be used for complex case discussion and staff training with wide stakeholder inclusion. This may include: heart failure including community teams, palliative care, diabetes & metabolic, and nephrology (with potential additional stakeholders determined locally).	Cardiac MDT guidance
	Urgent support capability: High risk, complex or unstable patients require more immediate discussion than a standard MDT meeting can provide. A&G within 72 hours should be offered to provide this. This should not delay admission where necessary.	See A&G resource Principle 1
	Broad accessibility: CVKM MDT meetings should be accessible to all of a patient's care providers (as per principle 1) to ensure support for all CVKM patients.	NICE NG108 1.1.2
	Integrated CVKM services: MDT integration between primary care and specialised services should be tailored to local community service structures. Specialty CVKM support for Primary Care CVKM services through A&G and MDT meetings can support the timely and seamless transfer of care when required.	CVDPREVENT
	Supporting staff during training and implementation: Many A&G and MDT referrals are driven by lack of confidence or experience felt by staff previously used to working in a siloed specialty. Ensuring adequate support during training can help prevent unnecessary MDT case discussion.	Training standards
	Consideration of parallel co-morbidity or risk: People living with advanced CVKM have, or are at far greater risk of onset of, other impactful illnesses. These include peripheral arterial disease, depression and COPD. Screening for or communicating with relevant clinical stakeholders during follow up will serve in the patients' best interest.	ESC whole arterial system

Principle	Recommendation/Action	Resources (links)
Principle 5: **Whole pathway patient support** Hospital admissions are part of long term health journey and are more frequent for CVKM patients. Admissions will more often be under other specialty teams e.g. Vascular and carry high rates of complications such as AKI and medicines discontinuation. Readmission rates are high and early follow up is often necessary. Long term outcomes for CVKM patients are relatively poor and this must be part of care planning.	**Care during hospitalisation:** CVKM services should provide support for teams caring for CVKM patients during hospitalisation, and early follow up after discharge to reduce the burden of readmission. This will be dependent on local service structure and may be delivered through direct A&G or in partnership with renal outreach, AKI nurses, in-patient and community HF nurses, DSN, primary care, and admission avoidance / hospital at home teams.	 AMV23N2_CaReMe_V2.pdf
	Communication at transition of care: Means to identify unplanned CVKM admissions should be considered. This may be through e-alerts or daily admission filters. Minimum quality standards for discharge letters should be agreed and monitored, including diagnostic codes, clinical summaries, medicines changes and plans. Copies should be sent to all necessary stakeholders.	UK AKI Summit report
	Urgent access for patients: Outpatient services must be accessible to patients and their primary care providers at short notice and have capacity for drop in and urgent care visits e.g. via SDEC. The availability of these and means to access them must be clearly communicated to patients and carers.	SDEC
	CVKM as stakeholder group: A high proportion of general patients in inpatient and outpatient settings in other domains have CVKM co-morbidities. Awareness of risks and complications should be included in local SOPs such as medicines reconciliation, acute kidney injury (AKI) care, and follow up planning. External knowledge of CVKM services may be limited and as such CVKM should identify itself as a stakeholder for engagement in standard operating procedure (SOP) development etc in areas of risk.	Review
	Advanced Care Planning: Where appropriate, long term care planning should be introduced into discussion with patients at the earliest opportunity, services should include facility to support patients in decision making.	NHSE ACP

Principle	Recommendation/Action	Resources (links)
Principle 6: **Training, education and research** Long term sustainability planning through formal education for staff is necessary and must be included in CVKM service planning. Providers should consider workforce redesign such that over the next 5-10 years, most members of the multiprofessional team (medical, nursing, pharmacy etc) should be multiskilled and able to advise/manage patients across all aspects of the CVKM pathway, supported by single discipline experts.	**Training:** Staff working in CVKM clinics require access to training in MLTC. Non-medical prescribers should be supported to extend their scope of prescribing practice to encompass all relevant therapies.	UKCPA CaReMe UK webinar
	Workforce: Services should target the development of a sustainable specialised CVKM workforce with training curriculum tied to real world data on clinical challenges.	DHSE major conditions strategy
	Education: Service leads should work with local Universities to ensure adequate opportunities for training in CVKM within Advanced Clinical Practitioner (ACP) courses.	Example: UoGM HF PGDip
	Experience: Service leads should ensure adequate exposure to CVKM specialty clinics for trainee medical, nursing and pharmacy staff in relevant specialties.	HEE CVD training guide
	Improvement: Research and quality improvement should be included as integral components of CVKM training to facilitate ongoing long-term improvement.	AQUA
	Knowledge generation: CVKM clinics should have means to facilitate access to research trials in the CVKM space, such as where CVKM inclusion criteria and outcomes are specified.	NIHR CVD

Core process map for specialty-led CVRM service pathway: operational example NOT prescriptive model

REFERRAL

Source	Primary Care	Hospital @ home	Acute admission	Single specialty clinic: Heart Failure, Renal, Endocrine, Vascular	
Criteria	• Existing HF, including HFpEF, with: o suboptimal therapy due to CKD, AKI, hyperk or perceived risk o CKD g3b-5 and / or a3 • Recent or current HF admission with AKI or hyperk discharged with meds changes			• Exiting HF & CKD under both teams • Existing Renal service patient with de novo diagnosis of HF needing optimisation and FU • Existing HF patient with do novo CKD meeting NICE referral criteria • Other MLTC or frailty scenarios with complex care decisions needed where service may help	
Route	Community referral to HF or renal	A&G or interhospital referral	AKI or hyperk e-alert	Pt under both HF & renal (proactive pull)	Cross-specialty referral letter
Triage	**All referral, all routes, all criteria triaged via dedicated CVRM triage clinician. Determine which clinician to see at first appt based on need (renal or HF, consultant or ACP)**				

FOLLOW UP

Risk	Routine, low risk: manage in situ	Long term risk eg high KFRE, suboptimal therapy, WRF	High risk: new diagnosis, post discharge, congested, AKI
Response	Advice & guidance (within 72 hours, same day where possible)	& CVRM clinic: MLTC FU	CVRM clinic: Urgent care and optimisation slots
Follow up	Optional CVRM MDT FU	First appt within 6 wk, 3-6M FU. Decide next reviewer at appt.	First appt within 3-7 days, review every 1-4 weeks
Parallel care	**Parallel renal metabolic and cardiometabolic clinics (examples, not exhaustive):** • Not on SGLT2i due to hypoglycaemia or elevated HbA1c • Candidate for GLP1ra to support intervention e.g. CABG • CGM where eGFR falling and impacting glycaemic control	**Complex care co-ordinator oversight for:** • Cross site and cross specialty Follow up planning • Co-ordination and merging of bloods and investigations • Information sharing & review of GP actions from clinics • Co-ordination and management of MDT	Transfer to A&G or MLTC clinic when optimised, stable Supplementing OP and community services, provide ad hoc remote cardiorenal in-reach for HF or CKD patients admitted with AKI or hyperk (identified via e-alerts), supporting optimal IP care & post-discharge FU.

Monthly cross-specialty MDT meeting for complex case discussion (e.g. device suitability, early re-imaging, unplanned admissions, onward referrals, adverse events). Hybrid format, 60 - 90 min duration.

DISCHARGE

Criterion	Progression towards ESKD, any HF	Stable / decongested, optimised GDMT, causes established and investigated, device considered / treated		Optimised, stable early CKD, ongoing HF needs
	Optional CVRM MDT follow up as required	Ongoing criteria for renal FU	No renal FU needed	Optional CVRM MDT follow up as required
Discharge	Advanced kidney care service	Local general nephrology clinic	Discharge to GP, add to CKD register	Heart failure clinic

A CVKM patient journey

Pauline, 58, has type 2 diabetes, her HbA1c currently 54mmol/mol on metformin and an SGLT2i. Her practice has adopted an integrated approach to CVKM care ensuring early use of SGLT2i. She has QRISK, BP, weight, smoking status, eGFR and albuminuria checked at each annual visit. This year, her uACR was 33 g/mol so an ACEi is started.

Her eGFR fell from normal to 56ml/min after initiation and titration of ACEi. The practice nurse is concerned about the results and considers suspending Pauline's therapies. She contacts the MRC service for advice and is given same day reassurance to continue RAASi and SGLT2i. She is sent links to material for further practice education and to help Pauline understand her kidney function.

The following year, Pauline notices that she is becoming progressively more breathless on hills and has developed ankle swelling. She is referred to the one stop heart failure clinic and diagnosed with HFrEF. Because of her diabetes, CKD and ACEi titration challenge, follow up for HF optimisation is arranged via the integrated clinic.

6 months later Pauline has a fall at home and suffers a fracture. During hospitalisation, her HF therapies are stopped due to an acute kidney injury and hyperkalaemia. The CVKM team support the orthogeriatricians in early reinitiation of these prognostically important medicines. When she is fit for discharge, an early follow up plan is in place with the CVKM drop-in clinic to recheck her clinical status and bloods, and to continue re-titration of HF therapies.

Unfortunately, due to incomplete AKI recovery Pauline is left with more advanced CKD and requires secondary care nephrology follow up. For continuity, Pauline remains under the care of the CVKM service but now appointments with the service renal consultant. This avoids the need for 2 follow up clinics.

Pauline develops anaemia and the preferred treatment is intravenous iron. The CVKM complex care co-ordinator notes that she is due follow up in in 3 weeks and arranges for the infusion to be given on the day of that appointment to limit the number of hospital visits Pauline needs. At the CVKM visit, it is planned to titrate her mineralocorticoid receptor antagonist. It is decided to make this dose change in 2 weeks so that post-titration bloods can be done at the same time as her post-iron infusion bloods. By asking Pauline if she has other blood tests due, her GP thyroid check GP is done with her CVKM clinic bloods to reduce appointments.

Pauline gained weight after her fall due reduced mobility and her HbA1c has risen significantly above target. She is referred for one stop assessment in the parallel renal metabolic clinic. She is reviewed by a DSN and the MDT (including diabetes consultant and renal consultant) recommend a DAFNE course and a wearable continuous glucose monitor. She is commenced on a GLP1 receptor agonist.

Over time, Pauline's CKD progression continues, and she is referred for consideration of kidney transplant. Because she has maintained optimal HF therapy, she has not had any HF hospitalisations and transplant planning echo shows improved LVEF. Importantly her weight and HbA1c have improved following the renal metabolic clinic review, also making transplant safer. After successful transplantation, Pauline no longer needs regular follow up via MRC. She is discharged with an open self-referral option. The A&G platform provides safety netting for clinical concerns from her new team and to flag acute episodes relevant to cardiorenal metabolic care that may otherwise not have been referred and for which CVKM specialty-led services can help.

Abbreviations used in these resources where not given full name in text

(alphabetical, excluding medicines names)

A&G	Advice and guidance
AKCS	advanced kidney care services
AKI	acute kidney injury
CGM / HCL	Continuous glucose monitoring / hybrid closed loop
CKD	chronic kidney disease
CVKM	Cardiovascular KidneyMetabolic
ESC	European Society of Cardiology
ESKD	end stage kidney disease
FU	Follow up
GDMT	guideline directed medical therapy
HF	Heart Failure
hyperk	hyperkalaemia
KFRE	Kidney Failure Risk Equation
MLTC	multiple long-term conditions
NICE	National institute for Health and Care Excellence
pEF	preserve ejection fraction
rEF	reduced ejection fraction
SOP	Standard operating procedure
WRF	worsening renal function