

The Newcastle upon Tyne Hospitals NHS Foundation Trust

Management of Patients attending Radiology who are Diabetic or take Metformin

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1. Introduction

This procedure informs all staff disciplines within the Directorate of Radiology of the appropriate advice and guidance for the management of patients taking metformin or who are diabetic.

2. Guideline scope

All staff within the Directorate of Radiology who may offer advice to patients must be aware of this procedure and adhere to its guidance.

3. Management of Patients attending Radiology who take Metformin, or who are Diabetic

Metformin is not recommended for use in diabetics with renal impairment, because it is exclusively excreted via the kidneys. Accumulation of metformin may result in the development of the serious complication lactic acidosis.

The theoretical risk of lactic acidosis being precipitated by iodinated contrast media administration is entirely the same as the risk of contrast induced acute kidney injury (CI-AKI). Iodinated contrast media administration does not precipitate lactic acidosis by another independent mechanism.

Therefore, patients with stable renal function and estimated glomerular filtration rate (eGFR) greater than 30ml/min/1.76m² are at low to no risk of developing lactic acidosis as a direct consequence of iodinated contrast media administration alone.

The current guidelines to follow are The Royal Australian and New Zealand College of Radiologists (RANZCR) recommendations, which are endorsed by the Royal College of Radiologists (RCR) and are as follows:

Intravenous administration of iodinated contrast media:

Patients receiving intravenous iodinated contrast media with an eGFR above 30 ml/min/1.73 m² should continue taking metformin. Patients with an unknown recent eGFR, or an eGFR less than 30 ml/ min/1.73m², or who are unwell or have deteriorating renal function should cease metformin for at least 48 hours from the time of the examination, and an eGFR performed prior to restarting metformin.

In addition, RCR & RANZCR advises that: a recent eGFR level (within 3 months if possible) should be available for all patients attending for an elective examination requiring contrast with a history of renal disease or diabetes (or serum creatinine estimation as a minimum).

Where a patient requiring contrast has taken metformin on the day of a **routine** contrast examination, and the eGFR is **not known to be normal**, the examination may be cancelled and a new appointment arranged. Alternatively, the examination can be delayed whilst an eGFR is measured. eGFR testing machines may be available for use in the department in the near future.

Intra-arterial administration of iodinated contrast media:

In all cases check with the interventional Radiologists, but the RCR and RANZCR recommendations are shown below:

Patients undergoing an intra-arterial procedure requiring iodinated contrast media with an eGFR above 45 ml/min/1.73m² should continue taking metformin. Patients undergoing an intra-arterial procedure involving larger volumes of contrast media, and/or a procedure involving a risk of renal embolisation with an unknown recent eGFR, or an eGFR less than 45 ml/ min/1.73 m², or who are unwell or have deteriorating renal function, should cease metformin for at least 48hrs following intra-arterial administration of contrast media, and have eGFR estimated prior to restarting metformin.

Also refer to appendix 2: Flow chart for the management of patients taking Metformin within Radiology).

Intravascular iodinated contrast media should be given to any patient regardless of renal function status if the perceived diagnostic benefit to the patient, in the opinion of the radiologist and the referrer, justifies this administration.

3.1 Diet controlled Diabetics:

Follow the instructions in the patient letter. Normal non-diabetic preparation.

3.2 Insulin controlled Diabetics:

Follow the instructions in the patient letter. If a patient is required to fast for their examination an appointment should be offered early in the morning where possible. Patients should omit insulin prior to their examination, but bring their insulin with them and something to eat. Food and insulin should be taken immediately after the examination.

3.3 Tablet controlled diabetics (but not metformin/ glucophage):

Follow the instructions in the patient letter. If a patient is required to fast for their examination an appointment should be offered early in the morning where possible. Patients should omit tablets on the morning of the scan but bring their tablets with them and something to eat. Food and tablets should be taken immediately after the examination.

3.4 **Metformin (Glucophage) controlled diabetics:**

Follow the instructions in the patient letter. If a patient is required to fast for their examination an appointment should be offered early in the morning where possible. Patients should omit tablets on the morning of the scan but bring their tablets with them and something to eat. Food and tablets should be taken immediately after the examination.

Also see sections on intravenous and intra-arterial administration of contrast media regarding renal function.

All patients taking metformin must be advised to tell the radiographer or radiologist performing their examination that they are taking metformin.

3.5 **If a patient experiences sickness or vomiting following a contrast examination.**

If a metformin controlled diabetic suffers from sickness or vomiting in the 48 hours after a contrast examination, they should not take their metformin. Between 9am and 5pm, they should phone the department and discuss with a radiographer or a radiologist. Alternatively they could contact the Diabetes Clinic. After 5pm and before 9am, they will have to contact the RMO via switchboard. They will need to have their U&Es and blood sugar checked. If these are abnormal, they should contact the Diabetic Clinic during office hours, or the RMO outside office hours.

3.6 **Patients requiring picolax preparation.**

Diabetic patients who require picolax preparation for their examination will **require admission onto a ward**. The Radiology appointments officer will liaise with the referrer's secretary or waiting list officer to arrange a two day ward admission.

3.7 **In all cases "diabetic on diet/ insulin/ tablet/ metformin" must be recorded on the patients request card.**

3.8 **Telephone enquiries regarding patients taking metformin (glucophage). Advice to Radiology Bookings Officers**

- Metformin is most commonly taken by diabetic patients to control blood sugar. Occasionally, it can also be taken for other conditions, including obesity, Polycystic Ovary Syndrome (or Disease), abnormal ovulation, infertility, HIV Lipodystrophy Syndrome.
- Patients who are to undergo an examination requiring injection of contrast medium, e.g. CT, IVU, Angiography, Venography should be asked if they are taking metformin. If yes, advice will depend on renal function (see appendix 2: Flow chart for the management of diabetic patients within Radiology).
- If a patient, who normally takes metformin, suffers from sickness or vomiting in the 48 hours after a contrast examination, **they should not take their metformin**. Between 9am and 5pm, they should phone the department and discuss with a radiographer or a radiologist. Alternatively they could contact the Diabetic Clinic. After 5pm and before 9am, they will have to contact the RMO via switchboard. They will need to have their U&Es and blood sugar checked. If these are abnormal, they should

contact the Diabetic Clinic during office hours, or the RMO outside office hours.

4. Training

Training will be provided at department induction for all new Radiologists, Radiographers and Radiology Bookings Officers. Responsibility for compliance with training lies with:

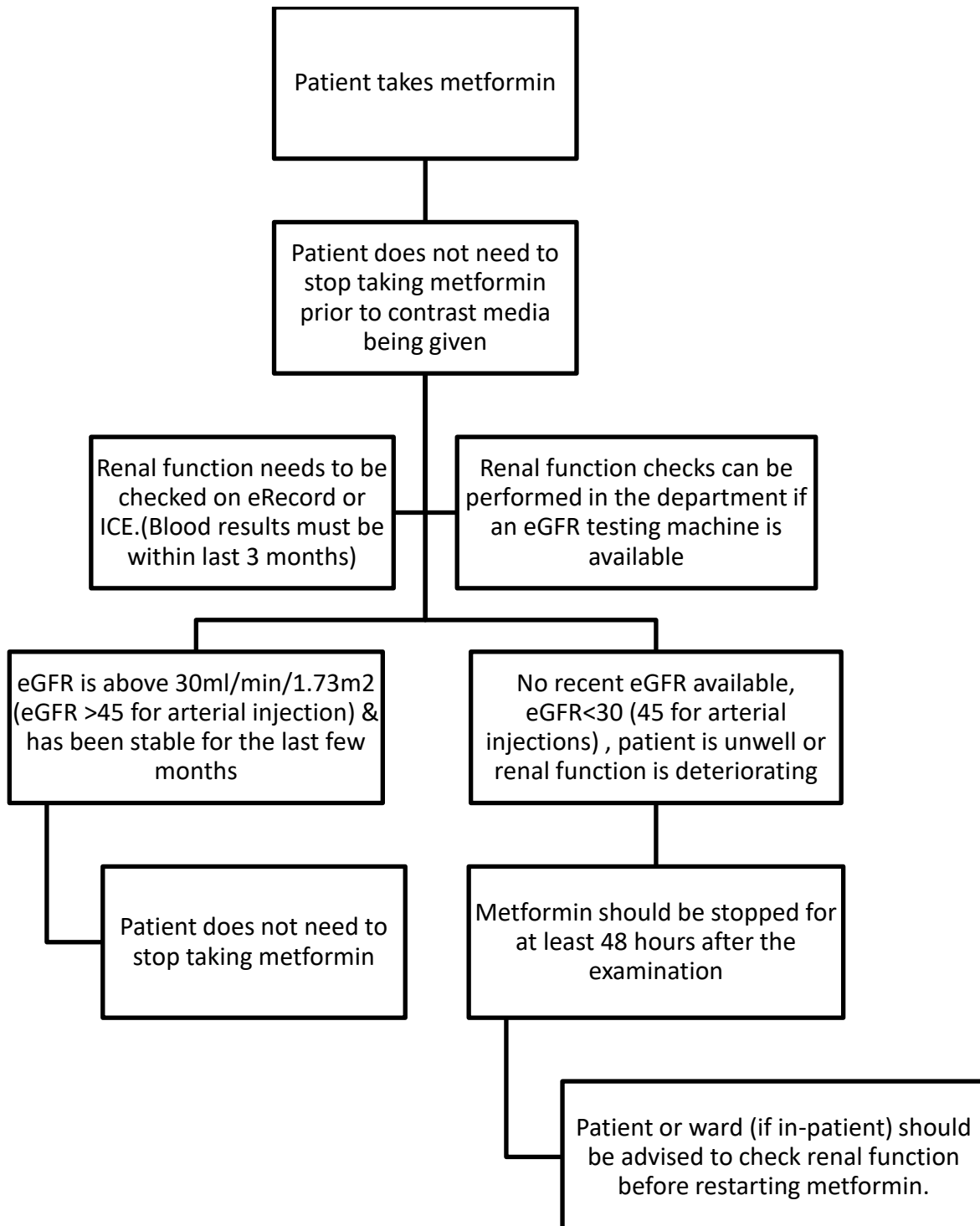
- Head of Department: all medical staff within the Directorate of Radiology
- Service Manager/ Superintendent Radiographer: all radiographic and ancillary staff
- Office Manager: Radiology bookings officers

5. References

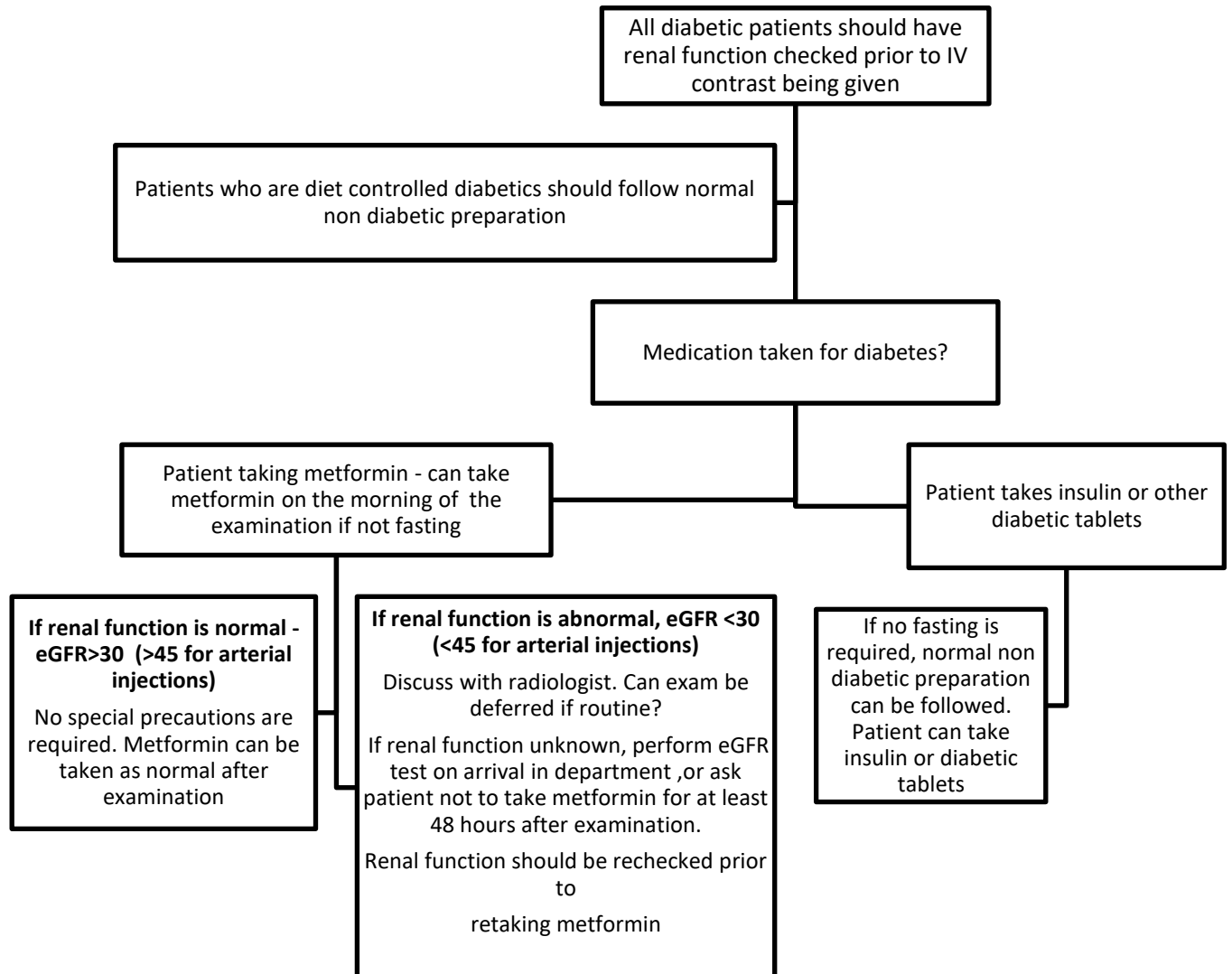
Iodinated Contrast Media Guideline; The Royal Australian and New Zealand College of Radiologists, March 2018 (endorsed by the Royal College of Radiologists)

A flow chart representation of process is available in Appendix 1 and 2

Appendix 1: Flow chart for the management of patients taking Metformin within Radiology



Appendix 2: Flow chart for the management of diabetic patients within Radiology



If fasting is required, early morning appointments should be given where possible for diabetic patients. No diabetic treatment (tablets or insulin) should be taken. No solid food should be eaten for 5 hours prior to the exam. Food & diabetic tablets or insulin should be brought to the hospital to be taken after the appointment. Advice about restarting metformin will be given to the patient by a radiographer, radiologist or the referrer once the renal function checks have been performed.