



MSC CLINICAL PHARMACY PHARMACEUTICAL CARE PLAN

A. PATIENT BACKGROUND AND MEDICATION LIST

Reason for selecting this

I selected this patient EA as a diabetes case study as I felt it was an appropriate topic for the pharmaceutical care plan with opportunities for intervention. I was able to draw upon what I had learned in the clinical diploma and utilize my current knowledge of guidance and practice to apply to this patient. This case has enabled me to demonstrate my skills as a pharmacist by making interventions to benefit the patient.

Patient Details

Initials: EA	Age: 67 years	Male <input type="checkbox"/> Female <input checked="" type="checkbox"/>
Weight: 73 kg	Height: 1.62 meters	BMI: 27.8 kg/m ²

Patient History

Presenting Complaint: Abdominal pain, nausea and diarrhoea

Past Medical/Surgical/Mental Health History: Diabetes Type 2 diagnosed recently a few weeks ago, hypertension, osteoarthritis. No surgical/ mental history.

Patient History
Social History: Patient does not smoke or drink. Walks twice a week to the shops (fifteen minute walk each way). Lives in a flat with husband. Patient does not drive. Regularly eats two of their five recommended five vegetable and fruits per day.
Impression/Diagnosis: Diabetes Type 2, could be side-effects from metformin tablets, since it's the most recently prescribed medicine for patient which can cause those side-effects.
Plan: GP referral letter regarding metformin as patient is experiencing possible side-effects. Lifestyle modifications advice (weight loss and dietary advice) to enable good diabetic control. Patient to consider the use of a food diary to make patient more aware of dietary choices. This will help patient to keep blood pressure under control over a longer period of time. Encourage patient to enquire about her blood pressure and cholesterol results so their can keep a track of their condition. Establish a patient education protocol where patient is to be provided with more information regarding diabetes and potential complications as well as importance of regular appointments. Need to discuss with patient what they are aware of in terms of self-management (i.e. foot examinations and eye tests).

Medication History	
Medication List	Indication and Evidence
Atorvastatin 20mg tablets- One to be taken daily	Statin licensed for primary prevention of CVD, as recommended by NICE (1).
Indapamide 2.5mg tablets- One to be taken daily	Diuretic licensed for use in essential hypertension. As recommended by BNF for hypertension (2).
Lisinopril 20mg tablets- One to be taken daily	ACE inhibitor licensed for use in hypertension. As recommended by NICE for management of management of hypertension. (3)

Medication History	
Medication List	Indication and Evidence
Metformin 500mg tablets- Two to be taken twice a day	Biguanide licensed for use in diabetes mellitus. As recommended by NICE for management of diabetes (4).
Nabumetone 500mg tablets- One to be taken twice a day	NSAID licensed for use in osteoarthritis as recommended by BNF for management of osteoarthritis (5).
Patient is also not taking any OTC or herbal medication.	
Allergies/Sensitivities	No known drug allergies; No know food allergies/intolerances; No known excipient allergies.

B. PROGRESS NOTES AND MEDICATION CHANGES

Progress Notes	
Date	Notes
09/11/2016	Mrs EA came into her regular pharmacy where I was the responsible pharmacist (RP) to collect her regular medication. Whilst dispensing the prescription, I selected Mrs EA for a targeted MUR as part of her annual review. At the MUR, I conducted a clinical review of the patient's condition and medication taken by the patient after obtaining written consent. There were a few issues raised. Patient EA was experiencing gastrointestinal side-effects (abdominal pain, diarrhoea and nausea) with the metformin 500mg tablets. She is taking the tablets, two to be taken twice a day as per the doctor's instructions.

Progress Notes

Date	Notes
	<p>Patient is also taking other medication (as shown under medication list) as directed by the doctor. Patient showed good adherence with all other medications as she organises her medication into a weekly box as a compliance aid, so she finds it easier to remember.</p> <p>I spoke to patient and told her that I will be informing the Doctor to amend her metformin to a modified-release version which is more tolerated. She was happy with the option.</p> <p>During the consultation, I also asked the patient when she last had a blood test, she said that it had been a while ago, but she doesn't remember exactly but it was not in the past year. Also asked about blood pressure and total cholesterol levels, but patient said that doctor had said they were within the range. I stressed the importance of being aware of the readings and the expected ranges so that better control can be achieved.</p>
10/11/2016	<p>Patient brought in prescription for metformin 500mg modified-release tablets. I counselled on use of tablets and what to expect. I also went through the side-effects spectrum with patient so she is aware of them (i.e. digestive problems, such as nausea, being sick, diarrhoea, abdominal pain and loss of appetite) (6). I explained that these side effects most often happen at the beginning of the treatment with metformin modified-release tablets and it helps if the doses are spread out over the day and to take metformin with or straight after a meal. If symptoms continue, to stop taking metformin and to come and see us or talk to your doctor.</p>
14/11/2016	<p>Patient came back again and mentioned that she is still getting side-effects (nausea, abdominal pain and diarrhoea) with the new formulation, and it seems not to be tolerated. I contacted the GP to inform him about the patient's side-effects and to amend her metformin to an alternative medication.</p>
15/11/2016	<p>Patient brought in prescription for pioglitazone. I counselled patient on what to look out for. Side-effects may include localised swelling (oedema), rapid increase in weight or unusual shortness of breath (7). Mentioned other counselling points such as to keep monitoring weight as the tablet can increase weight, and that she will need to go for blood tests as liver can be affected by pioglitazone.</p> <p>I signed the patient up for the NMS (New Medicines Service) so that this would be reviewed after a fortnight.</p>

Progress Notes

Date	Notes
29/11/2016	Patient is getting on well with her medication, no side-effects so far and feel that these are much better than the previous metformin formulations. Pt has been adherent to the medication.

Medication Changes

Medication List	Dose	Frequency	Route	Indication	Start/Continued Date	Stop Date
Metformin tablets	500mg	Two to be taken twice daily	Oral	Biguanide licensed for use in diabetes mellitus. As recommended by NICE for management of diabetes (4).	31/10/2016	09/11/2016
Metformin tablets MR	500mg	Two to be taken twice daily	Oral	Biguanide licensed for use in diabetes mellitus. As recommended by NICE for management of diabetes (4).	10/11/2016	14/11/2016
Pioglitazone tablets	30mg	One to be taken daily	Oral	Thiazolidinedione licensed for use in diabetes mellitus as recommended by BNF for management of diabetes mellitus (8). Also for use when metformin is not tolerated by patient (4).	15/11/2016	Continuing medicine

C. MONITORING PLAN

Monitoring Plan			
Parameter	Justification	Frequency	Result(s) and Action Plan
Hb1Ac level	Level of Hb1Ac needs to be kept at a controlled level as it shows glycaemic control over long term.	Every three to six months until stable and then six monthly thereafter.	If Hb1Ac level still raised, patient could benefit from an increase in her pioglitazone strength to see if this provides improved control. Aim for a Hb1Ac level of 7% as per NICE guidelines (4).
Blood pressure	Blood pressure to be regularly monitored and results noted by patient as need to check whether blood pressure is under control. Regular blood pressure checks can help reduce risk of cardiovascular disease events.	On a daily basis, at home using blood pressure monitoring kit.	Patient to aim for a blood pressure reading of below 140/90 mmHg (4). Current results are within the range as mentioned by patient.
Weight (BMI)	Weight to be monitored by patient, as she is already overweight. Weight reduction will help with diabetic and blood pressure control as well as reduce overall cardiovascular risk.	On a weekly basis, at home.	Patient is overweight with a BMI of 27.8. Patient to monitor own weight on a regular basis. Especially since a common side-effect of pioglitazone is increase in weight (7).

Monitoring Plan			
Parameter	Justification	Frequency	Result(s) and Action Plan
Serum Potassium levels	ACE inhibitors cause hyperkalaemia as a common side-effect. Important to know levels of serum potassium, when increasing doses of ACE inhibitors.	On an annual basis.	Have referred patient to the GP for blood test.
Cholesterol	High levels of cholesterol can increase risk of cardiovascular disease (1).	On an annual basis.	Have referred patient to the GP for blood test.
Serum urea, creatinine, eGFR, electrolytes	ACE inhibitors can cause renal impairment due to their mechanism of action, so these parameters need to be monitored.	On an annual basis.	Have referred patient to the GP for blood test.
Liver Function Tests	ACE inhibitors should be discontinued if there is a marked elevation of hepatic enzymes or if jaundice occurs. Pioglitazone and atorvastatin can be affected by medication, hence regular monitoring is required .	On an annual basis.	Have referred patient to the GP for blood test.
Eye Screening	Patient recommended to have an annual eye screening as per NICE guidelines (4).	On an annual basis.	During consultation, patient was not able to read properly. Lately she had found that reading has become more difficult due to slight loss of vision. Have referred patient to the GP for eye screening.
Foot Assessment	Patient recommended to have a foot assessment regularly as per NICE guidelines (4, 10).	On an annual basis.	Patient to have annual foot assessment by foot specialist.

D & E. IDENTIFICATION OF CLINICAL PROBLEMS AND ACTION PLAN

Analysis of Clinical Problems			
Clinical Problem	Assessment	Priority	Action Taken and Outcome
Type 2 Diabetes	<p>Important to offer structured education to adults who have type 2 diabetes with reinforcement and annual review.</p> <p>Ensure that patient is aware of own Hb1Ac levels.</p> <p>Important to ensure that diabetes control is optimal to prevent complications.</p>	High	<p>To continue to monitor patient's Hb1Ac level at intervals on three to six months. If Hb1Ac level is stable, this can be increased to six monthly intervals (4).</p> <p>Pioglitazone can also cause fluid retention and peripheral oedema as side-effects (7), hence important to inform patient on these.</p> <p>Monitor macro and microvascular problems associated with type 2 diabetes mellitus, ensure patient has regular foot and eye examinations at least on an annual basis (4, 10).</p>
Cardiovascular disease risk	Patient to have a cardiovascular disease risk analysis by doctor.	High	Patient needs to contact GP and arrange for a cardiovascular disease risk assessment.

Analysis of Clinical Problems			
Clinical Problem	Assessment	Priority	Action Taken and Outcome
BMI	Patient's BMI is 27.8, which classifies her as being overweight. This can impact on the quality of life and affect health.	High	Have discussed the need to lose weight to help decrease blood pressure and reduce CVD risk (4).
Osteoarthritis	Discuss management of osteoarthritis with patient to ensure that her condition is being managed well with pharmacological options if necessary.	High	Patient needs to make an appointment for a review with the GP. Important to offer regular reviews to all people with osteoarthritis. Reviews should include: monitoring the person's symptoms and the ongoing impact of the condition on their everyday activities and quality of life monitoring the long-term course of the condition discussing the person's knowledge of the condition, any concerns they have and their personal preferences (11).

F. FOLLOW-UP AND FUTURE PLAN

Follow Up Plan (including discharge requirements, future planning and ongoing assessments)	
Follow Up Requirement	Action Taken/Future Plan
Monitoring of Hb1Ac and glucose levels	Patient is aware that she needs to keep Hb1Ac level for 7% in line with NICE guidance (4) with GP to review blood results.
Atorvastatin (monitoring of LFTs) as well as monitoring of side-effects.	Liver function tests to be carried out after three months and then twelve months after starting treatment (9).
Close monitoring of blood pressure levels, heart rate and cholesterol levels	GP to monitor and review blood pressure and heart rate on a regular basis. Patient explained that she is able to come into pharmacy to have blood pressure measured or to purchase a blood pressure monitoring kit. Encourage patient to enquire about her blood pressure and cholesterol results so their can keep a track of their condition.
Monitoring of U&Es, renal function	GP to monitor and review U&Es, renal function on a regular basis.
Titration of ACE inhibitor to maximum tolerated doses	ACE inhibitor should be titrated to maximum tolerated dose if blood pressure not under control.
Patient to monitor own weight on a regular basis	Patient advised to monitor weight as she is overweight. Patient to consider the use of a food diary to make patient more aware of dietary choices. This

Follow Up Plan (including discharge requirements, future planning and ongoing assessments)

Follow Up Requirement	Action Taken/Future Plan
	will help patient to keep blood pressure under control over a longer period of time.
Healthy Lifestyle Interventions (Advice on regular exercise and dietary factors)	Patient is aware that she needs to lose weight and has mentioned that she will take a more active role in trying to lose weight by eating healthier and going out for regular walks. Patient to undertake regular exercise. Patient to speak to GP to refer to dietitian to review dietary factors. Patient provided with pharmacy own information leaflets on healthy diet/ foods.
Atorvastatin (monitoring of LTFs as well as side-effects monitoring)	Liver function tests to be carried out after three months, and then twelve months after starting treatment.
Annual flu vaccination	Mrs EA is in the recommended inclusion criteria to have the annual flu vaccination (12). Have mentioned that it can either be carried out at the pharmacy or through the GP surgery.
Diabetic Review	Diabetic review to take place in three months time due to a change in medication as per NICE guidance (4).
Patient Education	<p>Patient has been signposted to Diabetes UK website for more information (13). Patient to be referred to a local diabetes education group.</p> <p>Establish a patient education protocol where patient is to be provided with more information regarding diabetes and potential complications as well as importance of regular appointments. Need to discuss with patient what they are aware of in terms of self-management (i.e. foot examinations and eye tests).</p>

Follow Up Plan (including discharge requirements, future planning and ongoing assessments)

Follow Up Requirement	Action Taken/Future Plan
NMS (New Medicines Service) (medication changed to pioglitazone)	Pharmacist to follow up with patient in a fortnight to ensure medication is suitable and patient is not experiencing any side-effects.

G. CONTINUING PROFESSIONAL DEVELOPMENT

Learning Plan

Learning Need Identified	Action Taken	Completion Date
Use of medication in diabetes	I have read directed and essential learning of diabetes as part of the diploma learning. I have completed a CPD cycle on medication use in diabetes.	08/11/2016
I am not clear about guidelines and local services with diabetes in the locality where I work.	Have discussed with the main doctor from the nearby surgery to go through the surgery's prescribing guidelines in line with diabetes as well as other services that the doctors may liaise with in the locality.	07/12/2016
I would like to learn more about the monitoring parameters involved in diabetes.	Have discussed with the main doctor from the nearby surgery to go through the surgery's monitoring parameters in line with diabetes. Have also has a thorough read through NICE guidelines regarding type 2 diabetes.	07/12/2016

H. EVIDENCE AND REFERENCES

Reference List

1. National Institute of Health and Care Excellence (NICE). NICE Clinical Guidelines CG181: Cardiovascular disease: risk assessment and reduction, including lipid modification. [Internet] Available at URL: <https://www.nice.org.uk/guidance/cg181/resources/cardiovascular-disease-risk-assessment-and-reduction-including-lipid-modification-35109807660997> London. September 2016. Accessed December 2016.
2. British National Formulary (BNF) 72. London. BMJ Group and the Royal Pharmaceutical Society of Great Britain; Cardiovascular system. 68-217 2016.
3. National Institute of Health and Care Excellence (NICE). NICE Clinical Guidelines CG127: Hypertension in adults: Diagnosis and Management. London. [Internet] Available at URL: <https://www.nice.org.uk/guidance/cg127/resources/hypertension-in-adults-diagnosis-and-management-35109454941637>. November 2016. Accessed December 2016.
4. National Institute of Health and Care Excellence (NICE). NICE Clinical Guidelines Type 2 diabetes in adults: management. [Internet] Available at URL: <https://www.nice.org.uk/guidance/ng28/resources/type-2-diabetes-in-adults-management-1837338615493> London. December 2015. Accessed December 2016.
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11. National Institute of Health and Care Excellence (NICE). NICE Clinical Guidelines CG177: Osteoarthritis: Care and management. [Internet] Available at URL: <https://www.nice.org.uk/guidance/cg177/resources/osteoarthritis-care-and-management-35109757272517> February 2014. Accessed December 2016.
12. Public Health England. [Internet] Administration of inactivated influenza vaccine to adults in accordance with the community pharmacy seasonal influenza vaccination advanced service and national influenza immunisation programme. Available at URL: www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2016/08/phe-pgd-influenza-pharm-aug16.docx August 2016. Accessed December 2016.
13. Diabetes UK. [Internet] Available at URL: <https://www.diabetes.org.uk/> Accessed December 2016.

I. PROFESSIONAL FRAMEWORK MAPPING

RPS Foundation Framework			
Cluster 1 Patient and Pharmaceutical Care	Cluster 2 Professional Practice	Cluster 3 Personal Practice	Cluster 4 Management and Organisation
1.1 Patient Consultation <input checked="" type="checkbox"/> 1.2 Need for Medicine <input checked="" type="checkbox"/> 1.3 Provision of Medicine <input checked="" type="checkbox"/> 1.4 Selection of Medicine <input checked="" type="checkbox"/> 1.5 Medicine Specific Issues <input type="checkbox"/> 1.6 Medicines Information and Patient Education <input checked="" type="checkbox"/> 1.7 Monitoring Medicine Therapy <input type="checkbox"/> 1.8 Evaluation of Outcomes <input checked="" type="checkbox"/> 1.9 Transfer of Care <input type="checkbox"/>	2.1 Professionalism <input checked="" type="checkbox"/> 2.2 Organisation <input checked="" type="checkbox"/> 2.3 Effective Communication Skills <input checked="" type="checkbox"/> 2.4 Team Work <input type="checkbox"/> 2.5 Education and Training <input type="checkbox"/>	3.1 Gathering Information <input checked="" type="checkbox"/> 3.2 Knowledge <input checked="" type="checkbox"/> 3.3 Analysing Information <input checked="" type="checkbox"/> 3.4 Providing Information <input checked="" type="checkbox"/> 3.5 Follow Up <input checked="" type="checkbox"/> 3.6 Research and Evaluation <input type="checkbox"/>	4.1 Clinical Governance <input type="checkbox"/> 4.2 Service Provision <input checked="" type="checkbox"/> 4.3 Organisations <input type="checkbox"/> 4.4 Budget and Reimbursement <input type="checkbox"/> 4.5 Procurement <input type="checkbox"/> 4.6 Staff Management <input type="checkbox"/>

RPS Advanced Pharmacy Framework					
Cluster 1 Expert Professional Practice	Cluster 2 Collaborative Working Relationships	Cluster 3 Leadership	Cluster 4 Management	Cluster 5 Education, Training and Development	Cluster 6 Research and Evaluation
<p>1.1 Expert Skills and Knowledge AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>1.2 Delivery of Professional Expertise AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>1.3 Reasoning and Judgement AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>1.4 Professional Autonomy AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p>	<p>2.1 Communication AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>2.2 Teamwork and Consultation AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p>	<p>3.1 Strategic Context AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>3.2 Governance AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>3.3 Vision AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>3.4 Innovation AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>3.5 Service Development AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>3.6 Motivational AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p>	<p>4.1 Implementing National Priorities AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>4.2 Resource Utilisation AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>4.3 Standards of Practice AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>4.4 Management of Risk AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>4.5 Managing Performance AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>4.6 Project Management AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>4.7 Managing Change AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>4.8 Strategic Planning AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>4.9 Working Across Boundaries AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p>	<p>5.1 Role Model AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>5.2 Mentorship AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>5.3 Conducting Education and Training AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>5.4 Professional Development AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>5.5 Links Practice and Education AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>5.6 Educational Policy AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p>	<p>6.1 Critical Evaluation AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>6.2 Identifies Gaps in the Evidence Base AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>6.3 Develops and Evaluates Research Protocols AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>6.4 Creates Evidence AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>6.5 Research Evidence into Working Practice AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>6.6 Supervises Others Undertaking Research AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p> <p>6.7 Establishes Research Partnerships AS1 <input type="checkbox"/> AS2 <input type="checkbox"/> M <input type="checkbox"/></p>

APPENDIX

Please enclose a copy of the case-based discussion form (if applicable), here.

NA