Adult ADHD Service Specification and Prescribing Guidelines

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Brief Summary of Document:	This document provides the framework for the Adult ADHD Service based in Wellfield Road Resource Centre, Carmarthen, covering the population within Hywel Dda University Health Board. This document will describe the aims, values, principles, and standards of the service, and outline clinical guidance relating to pharmacological treatment of ADHD in adults.

Scope	The Adult ADHD Service within Hywel Dda University Health Board aims to provide a tertiary Service to adults aged 18 years and over, diagnosed and undiagnosed with ADHD. The Adult ADHD Service will provide a diagnostic and intervention service. The ADHD Service covers Carmarthenshire, Pembrokeshire, and Ceredigion and includes approximately 380,000 individuals. The service applies to the following patient groups: - Adults (aged 18 years and over) with no previous diagnosis, seeking a new diagnosis and treatment of ADHD. - Adults (aged 18 years and over) with a previous diagnosis but not currently treated, seeking re-assessment and treatment of ADHD. - Adults (aged 18 years and over) with a known diagnosis are currently treated, requiring an annual review of ADHD medication. This includes young adults who have transitioned from younger adult services. This document outlines the responsibilities of, and therefore must be followed by, all primary and secondary healthcare professionals who are involved in the assessment of ADHD in adults, and the prescribing, dispensing, administration,

	associated monitoring and stopping of medications for ADHD in adults (methylphenidate, lisdexamfetamine and atomoxetine).

To be read in conjunction with:	All Wales Child Protection Procedures (2008) All Wales Policy and Procedures for Protection of vulnerable Adults from Abuse (295) Clinical Record Keeping Policy (195) Data Protection Policy (225) Equity & Diversity Policy (133) Freedom of Information (173) HDUHB Medicines Management Policy (168) HDUHB Organisational Values Learning and Development Policy (113) Putting Things Right Procedure Written Control Documentation Policy (190)

Owning committee/ group:	Mental Health/Learning Disabilities Written Documents Control Group Kay Isaacs, Service Manager Adult Mental Health 17.10.2022

Reviews and updates		
Version no:	Summary of Amendments:	Date Approved:
1	New document	16.11.2021

Glossary of Terms

Term	**Definition**
ABPM	Ambulatory Blood Pressure Monitoring
ADHD	Attention Deficit Hyperactivity Disorder
AP	Advanced Pharmacist
ASRS	Adult ADHD Self-Report Scale
AQ10	Autism Spectrum Quotient (AQ10) Test
BNF	British National Formulary
CNS	Clinical Nurse Specialist
CMHT	Community Mental Health Team
CRHT	Crisis Resolution and Home Treatment
CSM	Committee on Safety of Medicines
DIVA	Diagnostic Interview for ADHD in adults
ECG	Electrocardiogram
GMC	General Medical Council
GP	General Practitioner
HBPM	Home Blood Pressure Monitoring
HDUHB	Hywel Dda University Health Board
MH&LD	Mental Health & Learning Disabilities
MHRA	Medicines and Healthcare products Regulatory Authority
NICE	National Institute for Health and Care Excellence

SPC	Summary of Product Characteristics
SUD	Substance Use Disorder
UKAAN	UK Adult ADHD Network

Keywords	ADHD, Adult ADHD, Adult ADHD Service, Prescribing Guidelines, Methylphenidate, Lisdexamfetamine, Dexamfetamine, Atomoxetine

Contents

1. Aim of Service

The service aims to provide specialist assessment, diagnosis, and pharmacological treatment of ADHD in Adults. This will include patients new to ADHD services, in addition to those with previous diagnoses from young person services, private healthcare providers, or out of the area (subject to review by the clinical team).

2. Background

ADHD is a common yet treatable neurodevelopmental condition. Historically, ADHD was considered a childhood disorder, usually resolved by late adolescence and early adulthood. However, it is now recognised that ADHD can continue into adulthood, with some studies have indicated that symptoms may continue into adulthood in as many as 70-80% of those diagnosed with ADHD as children (Kooij et al., 2019).

ADHD in adults is characterised by impairment in multiple domains across the lifespan, and when diagnosed correctly, it may be successfully managed and treated (Young et al., 2020). The clinical presentation of ADHD in adults may vary between individuals and can be divided into the following subtypes, depending on the nature of the symptoms; primarily inattentive, primarily hyperactive-impulsive, or combined type. Meta-analyses indicate that inattention is more strongly associated with academic impairment, low self-esteem, adverse occupational outcomes, and lower overall adaptive functioning. In addition, hyperactive-impulsive symptoms are associated with peer rejection, aggression, risky driving behaviours, and accidental injuries (Willcutt et al., 2012).

Prevalence rates in the adult population are estimated to be between 2.5% and 4.7% (Young et al., 2020); when applied to the HDUHB population, this equates to between 9,500 and 17,860 individuals who may have ADHD, including both diagnosed and undiagnosed. Unmanaged ADHD can carry a high social, health, and economic burden on individuals, families, and broader society.

Below are some of the significant consequences of untreated ADHD (Dey et al., 2019; Beheshti et al., 2020; Ruiz-Goikoetxea et al., 2018; Dalsgaard et al., 2015; Mohr-Jensen et al., 2019; Sundquist et al., 2015):

- Decreased quality of life.
- Increased incidence of substance use disorder (SUD).
- Increased incidence of impulsive behaviours, e.g., unprotected sex, gambling, teenage pregnancies, and eating disorders.
- Accidental injury, including road traffic accidents.
- Increased incidence of criminal offences.
- Increased incidence of suicide and self-harm.

Pharmacological treatment has been demonstrated to reduce accidental injuries, substance use, educational or occupational underachievement, sexually transmitted infections, depression, suicide, criminal activity, and teenage pregnancies (Jangmo et al., 2019; Mohr-Jensen et al., 2019; Ruiz-Goikoetxea et al., 2018; Hua et al., 2020; Chang et al., 2014).

An Adult ADHD Service has been identified as a priority area for development within the HDUHB. The service began with limited funding for a consultant psychiatrist with a particular interest in ADHD in adults, to begin tentatively assessing and treating patients. Since its inception, the demand has grown significantly, with a waiting list in excess of 600 patients. This increase in demand is likely to have been driven by increased awareness of the condition and the service. It demonstrates the potential numbers of adults living with previously undiagnosed ADHD.

This is supported in the literature, Kooij et al. (2019) suspect that many adults were never diagnosed as children due to lack of historic recognition of ADHD, age dependant change in presentation, and stigma (among public and healthcare professionals alike). There is also evidence to suggest that diagnosis of ADHD in females is often overlooked due to differences in symptom profiles and associated functioning compared to males (Young et al., 2020).

ADHD has high rates of co-comorbidities. As much as 80% of individuals with ADHD will have a co-morbid condition, including substance use, anxiety, depression, and other neurodevelopmental conditions (Fayyad et al., 2016). The high prevalence of co-morbidities mean that adults with ADHD will present to other services, both within primary and secondary care. Untreated ADHD in adulthood is more likely to lead to a lack of engagement with other services and potentially a lack of adherence to treatments provided by them. A high functioning Adult ADHD Service within HDUHB will therefore offer benefits to broader healthcare services within the health board, in addition to the target patient population. It is hoped that establishing such a service will provide a platform for increased joint working and better overall management for patients with co-morbidities and complex needs.

3. Service Objectives

The overarching objective of the Adult ADHD Service is to provide the highest quality care to adults with ADHD via a tertiary service that works in partnership with primary and secondary care providers, in line with NICE guidelines, HDUHB organisational values, legislation and good practice.

The specific objectives are:

- Provide specialist and comprehensive assessment and diagnosis of ADHD in adults.
- Initiate medication used to treat ADHD in adults, and titrate to an optimal dose.
- Communicate effectively with primary care to facilitate ongoing prescribing.
- Offer review of ADHD medication annually, or when appropriate.
- Offer specialist support and advice to other healthcare professionals who are involved in the prescribing and dispensing of medications used to treat ADHD in adults.
- Develop links with existing services within the directorate to facilitate future joint working.

4. Service Scope

This service specification covers all aspects of working within (clinical and administrative) or alongside (primary and secondary care) the Adult ADHD Service.

The Adult ADHD Service will operate as a tertiary service within HDUHB. This document will cover the following service areas:

- Diagnosis of ADHD in adults
- Assessment of ADHD in adults
- Treatment of ADHD in adults
- Consultation, advice, support and review of ADHD in adults

The HDUHB covers three counties (Carmarthenshire, Pembrokeshire, and Ceredigion) which equate to approximately 380,000 individuals.

The service applies to the following patient groups:

- Adults (aged 18 years and over) with no previous diagnosis, seeking a new diagnosis and treatment of ADHD.
- Adults (aged 18 years and over) with a previous diagnosis but not currently treated, seeking re-assessment and treatment of ADHD.
- Adults (aged 18 years and over) with a known diagnosis are currently treated, requiring an annual review of ADHD medication. This includes young adults who have transitioned from younger adult services.

At present, the service is in its infancy and has limited resources and capacity. As a result, the service is unable to provide case management, offer crisis management or ad-hoc reviews (unless clinically indicated). Comorbid mental health (or physical) conditions will need to be managed through the appropriate service e.g. CMHT, the Adult ADHD Service will be available for advice where this is appropriate.

5. Service Description

5.1 Referral Pathways

Individuals are referred directly to the ADHD service, using the service referral form (Appendix A). Referrals are accepted from a range of health or social care providers, including; GPs, primary and secondary mental health services, probation/offender services, social services, neurodevelopmental services.

Referrals are screened for suitability/appropriateness and prioritised according to risk and needs, in a weekly MDT meeting. Referral criteria and exclusion criteria are shown below.

Referral Criteria

- Adults aged 18 or over (referrals from younger adult services in advance of a patient turning 18 will be placed on a spreadsheet and added to our waiting lists when they turn 18).
- Adult ADHD Service referral form (Appendix A) completed (including all relevant fields), with attached rating scales (ASRS and AQ10).
- The patient is consenting to referral and willing to engage with the Adult ADHD Service.

Exclusion Criteria

- Lack of evidence demonstrating associated impairment due to symptoms.
- Evidence of significant acute co-morbid mental health problems – referral to the appropriate service should be made in the first instance before seeking ADHD assessment.
- Where a patient does not wish to seek pharmacological treatment.
- Current problematic/unstable substance use (referrals may be considered when stable and engaging with drug and alcohol services).
- Failure to meet the above referral criteria.

Accepted referrals are added to the relevant waiting list (depending on whether they are waiting for an assessment or annual review). If a referral to the service is rejected, this will be communicated to the referrer, with the reason stated.

5.2 Assessment Process

Assessment with the Adult ADHD Service follows recommendations laid out by NICE guideline NG87 (2018), and the European Consensus Guidelines (Kooij et al., 2019).

A full assessment with the service consists of:

- Full psychiatric/neurodevelopmental history.
- Collateral information from a relative or spouse (where possible).
- Mental state examination.
- Diagnostic Interview for Adult ADHD (DIVA).
- Physical and cardiovascular assessment (when/if starting medication).
- Risk assessment of the risk of abuse and/or medication diversion.

The assessment may take a blended approach, where various elements may be delivered via virtual platforms, and over multiple appointments, due to the time taken to complete the process. Where patients have received the abovementioned elements via alternative providers, the service may accept these assessments to form part of the overall ADHD assessment, subject to review by the clinical team.

5.3 Post Diagnostic Process

Following the assessment process, if ADHD is confirmed, the post-diagnostic process consists of the following:

- Discussion of the impact of a positive diagnosis of ADHD in the context of the patient's circumstances.
- Discussion of available medication to treat ADHD.
- Basic psychoeducation and signposting to educational and self-help materials.
- Signposting to other relevant services where applicable.
- Agreement of a treatment plan, taking into account patient preferences.
- Where appropriate, prescribing of medication as outlined in section 7 – prescribing guidelines.

5.4 Annual Review Process

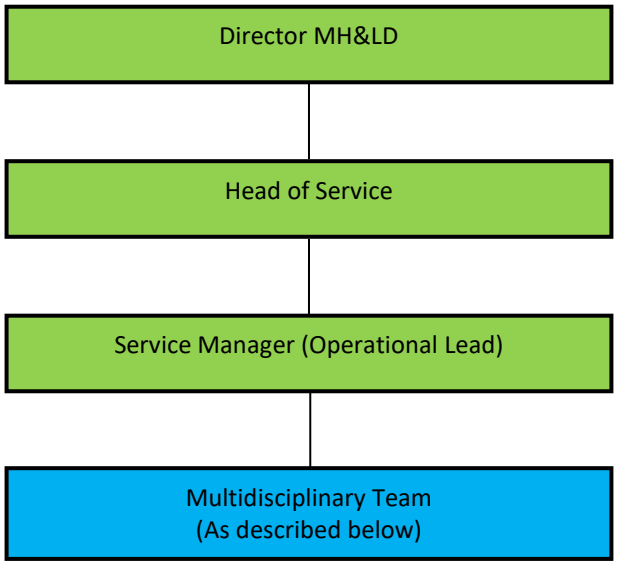
For patients who are treated with ADHD medication, it is intended that they receive an annual review with the ADHD service. This review process will also apply to those who have transitioned from younger person services and consists of the following:

- A discussion of the positive impact that ADHD medication has had on the individual.
- A review of any adverse effects attributed to the ADHD medication, including a review of blood pressure, pulse, and weight measurements.
- Assessment of medication adherence, with an exploration of the effects of planned and unplanned missed doses.
- Determination of the ongoing need for medication, informed by the benefits and risks of continued prescribing.
- Where applicable, consideration of possible changes to medication to optimise response.
- Communication of the outcomes of the review with primary care for continued prescribing.
- Basic psychoeducation and signposting to educational and self-help materials.
- Signposting to other relevant services where applicable.

6. Team Composition

The ADHD team sits within the Mental Health and Learning Disabilities (MH&LD) directorate.

ADHD Management Structure



Specialist Consultant Psychiatrist

The specialist consultant psychiatrist is the clinical lead within the team, and participates in MDT meetings where referrals are screened and prioritised and complex cases are discussed when necessary. The Consultant offers assessment, diagnosis, and pharmacological treatment of ADHD to both new and existing patients, in addition to the provision of basic psychoeducation. The consultant also offers support and advice to non-medical prescribers as appropriate.

Clinical Nurse Specialist (CNS)

The CNS is a non-medical prescriber and participates in MDT meetings where referrals are screened and prioritised and complex cases are discussed when necessary. The CNS offers assessment, diagnosis, and pharmacological treatment of ADHD to both new and existing patients, in addition to the provision of basic psychoeducation.

Advanced Pharmacist (AP)

The AP is a non-medical prescriber and participates in MDT meetings where referrals are screened and prioritised and complex cases are discussed when necessary. The AP offers assessment, diagnosis, and pharmacological treatment of ADHD to both new and existing patients, in addition to the provision of basic psychoeducation. The AP also provides pharmacological advice/support to service users and the wider team.

Medical Secretary

In addition to the responsibilities outlined under team secretary, the medical secretary role includes taking minutes during MDT meetings, assisting with correspondence and prescription administration

Team Secretary

The team secretary responsibilities include answering telephone calls and written correspondence, inputting data, managing waiting lists etc.

7. Prescribing Guidelines

7.1 Scope

This guideline is intended to be used in all situations where medications for ADHD in adults (methylphenidate, lisdexamfetamine and atomoxetine) are prescribed for patients who are referred to the specialist Adult ADHD Service. The guidelines will outline the responsibilities of, and therefore must be followed by, all primary and secondary healthcare professionals who are involved in the prescribing, dispensing, administration or monitoring and stopping of medications for ADHD in adults (methylphenidate, lisdexamfetamine and atomoxetine).

7.2 Aim of Guideline

The aim of this guideline is to ensure that medications for ADHD in adults (methylphenidate, lisdexamfetamine and atomoxetine), are used in line with current evidence and patient safety advice, to maximise patient benefit whilst preventing avoidable harm.

7.3 Objectives

The aims will be achieved by:

- Safely initiating medications for ADHD (methylphenidate, lisdexamfetamine and atomoxetine) by thorough baseline assessment and closely monitored titration.
- Optimising the use of medications for ADHD (methylphenidate, lisdexamfetamine and atomoxetine) by balancing benefits (control of symptoms) against risk (adverse effects of medication).
- Monitoring the ongoing use of medication for ADHD (methylphenidate, lisdexamfetamine and atomoxetine) by effective use of shared care protocols between primary and secondary care.

7.4 General Prescribing Information

Medication should be offered to adults with ADHD if their symptoms are still causing a significant impairment in at least one domain after environmental modifications have been implemented and reviewed.

Medication for ADHD should only be initiated by, or under the direct supervision of the HDUHB Adult ADHD Service.

Consider non-pharmacological treatment for adults with ADHD who have:

- Made an informed choice not to have medication.
- Difficulty adhering to medication.
- Found medication to be ineffective or cannot tolerate it.

Consider non-pharmacological treatment in combination with medication for adults with ADHD who have benefited from medication but whose symptoms are still causing significant impairment in at least one domain. When non-pharmacological treatment is indicated for adults with ADHD, a referral should be made to appropriate psychological services available within the health board.

Healthcare professionals initiating medication for ADHD should:

- Be familiar with the pharmacokinetic profiles of all the short- and long-acting preparations available for ADHD (see Appendix A)
- Ensure that treatment is tailored effectively to the individual's needs.
- Consider variations in bioavailability or pharmacokinetic profiles of different preparations to avoid reduced effect or excessive adverse effects.

Note that some of the recommendations in these guidelines are outside of the individual product licences (see Appendix B). Whilst the recommendations made in this guidelines are evidence based, those involved in the prescribing, monitoring and dispensing of medications for ADHD in adults should familiarise themselves with the GMC guidance on prescribing off label medicines (GMC, 2021). Prescribers should also familiar with the requirements of controlled drug legislation governing the prescription and supply of stimulants. See NICE's guideline on controlled drugs (NICE, 2016).

7.5 Management of Co-Morbidities

Severe mental health disorders such as psychosis, major depression, mania, or SUD should be treated prior to commencing ADHD medications. The service user should be referred to the relevant team or service for management of these co-morbidities. ADHD medications may be considered in these groups of people once the management of their primary problem is stable, and they are actively engaging with the relevant team or service.

Milder depressive and anxiety disorders may resolve following effective treatment of ADHD, in these instances, ADHD may be treated as the priority.

7.6 Pre-Treatment / Baseline Assessment

A review of physical health and a cardiovascular assessment should be conducted prior to initiating methylphenidate, lisdexamfetamine, and atomoxetine. Baseline measurements of blood pressure, pulse and weight should be recorded.

Routine blood tests (including liver function tests) are not necessary, unless there is a clinical indication (NICE, 2018).

<u>Cardiovascular Assessment / Examination</u>

A cardiovascular assessment should include:

- Exploration of personal and family history of cardiac problems or symptoms suggestive of cardiac problems.
- Auscultation of heart sounds and valves.
- Blood pressure and pulse measurement.

An ECG is not needed before starting stimulants or atomoxetine, unless the person has any of the features below, or a co-existing condition that is being treated with a medicine that may pose an increased cardiac risk (NICE, 2018).

Refer for a cardiology opinion before starting medication for ADHD if any of the following apply:

- History of congenital heart disease or previous cardiac surgery.
- History of sudden death in a first-degree relative under 40 years suggesting a cardiac disease.
- Shortness of breath on exertion compared with peers.
- Fainting on exertion or in response to fright or noise.
- Palpitations that are rapid, regular and start and stop suddenly (fleeting occasional bumps are usually ectopic and do not need investigation).
- Chest pain suggesting cardiac origin.
- Signs of heart failure.
- A murmur heard on cardiac examination.

- Blood pressure that is classified as hypertensive for adults, according to NICE guidelines (2019).

Risk of Substance Misuse / Diversion

A risk assessment for potential substance misuse and drug diversion should be undertaken for all service users (Kooij et al., 2018), when prescribing psychostimulants. Consider that stimulants are misused and diverted for cognitive enhancement and appetite suppression (Jeffers and Benotsch, 2016), in addition to recreational abuse.

Prescribe cautiously if risks are identified, and consider strategies to minimise risks on an individual basis e.g. avoiding formulations that may be easily injected if there is a risk of stimulant misuse or diversion. If there is evidence of misuse or diversion when a patient is treated with methylphenidate, lisdexamfetamine, or atomoxetine, the Adult ADHD Service should be immediately informed.

7.7 Medication Initiation and Choice

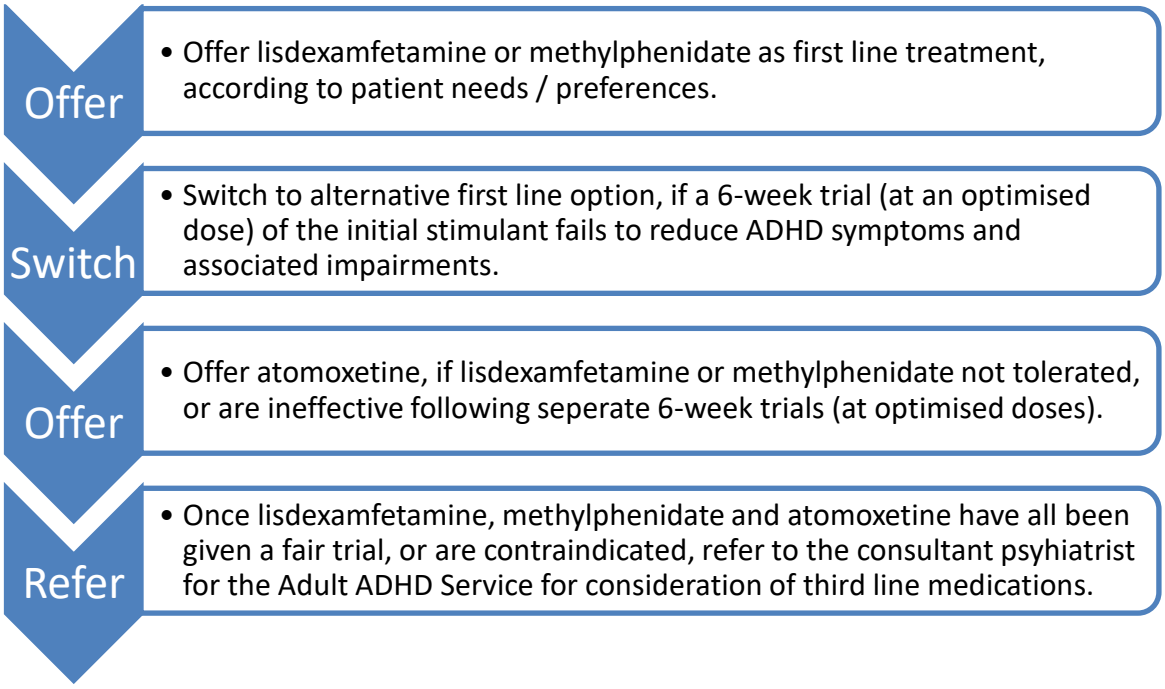
All medication for Adult ADHD will be initiated by the Adult ADHD Service, by a specialist nurse / pharmacist, or by a consultant psychiatrist. Primary care will be asked to resume prescribing under a shared care agreement, when the patient has been stabilised on medication.

Choice of Medication

Stimulants are regarded as first line treatment because they offer higher average clinical effects than atomoxetine (Kooij et al., 2018). Methylphenidate and lisdexamfetamine have comparable efficacy, though there is some evidence that amfetamines might be more effective in adults. The choice of stimulant should therefore be based on individual needs and patient preferences. A flow chart illustrating the choice of medication is shown in Figure 1, below.

Lack of Response / Effect

NICE guidelines (2018) suggest that stimulants should be given a fair trial at an adequate dose. There is no consensus on what constitutes an adequate dose, and is subject to considerable interindividual variability, clinical judgement should therefore be used. Before switching medications, consideration should be given to dose optimisation of the current medication – switching to longer acting formulations may offer better symptom control or tolerability in some patients.



Dexamfetamine

Immediate release dexamfetamine should not be routinely considered, due to its considerable abuse potential. This should only be prescribed under the advice and recommendation of the consultant psychiatrist for the Adult ADHD service.

Substance Use Disorder

Historically, guidance have recommended atomoxetine as first line when treating ADHD in adults with comorbid SUD. Current NICE guidance (2018) do not make a specific recommendations, but advise caution if there is a risk of misuse / diversion, and the use of longer acting formulations to minimise the risk. If the clinician believes there is a risk of misuse or diversion, the treatment plan should be discussed with the consultant psychiatrist before prescribing.

7.8 Dose Titration

Treatment with psychostimulants requires careful titration due to marked individual differences in final dose, titration to optimal dose usually takes around 6 weeks. Recommended dosing regimens, significant interactions, legal and licencing information for different medications and formulations of methylphenidate, lisdexamfetamine and atomoxetine are displayed in Appendix B.

NICE guidelines (2018) suggest that during the titration phase, symptoms, impairment, and adverse effects should be recorded at baseline and at each dose change using standard scales. The Adult ADHD Service uses the Adult ADHD Self-Report Scale V1.1 (ASRS) to assess / record efficacy of medication, in addition to patient feedback / observation.

Co-Morbidities

Ensure that dose titration is slower and monitoring more frequent if, any of the following are present in people with ADHD:

- Neurodevelopmental conditions such as autism, tics, and learning disabilities.
- Mental health conditions such as anxiety spectrum disorders (including obsessive compulsive and post-traumatic stress disorder), schizophrenia, bipolar affective disorder, depression, personality disorders, eating disorders, and substance use disorder. Note that

as stated under 'Management of Comorbidities', the management of such disorders takes priority over that of ADHD.
- Physical health conditions such as cardiac disease, epilepsy or acquired brain injury.

Medicines Optimisation

Immediate-release preparations may be suitable if more flexible dosing regimens are needed, or during initial titration to determine correct dosing levels. Modified-release formulations could be considered when necessary, for reasons such as:

- Convenience
- Improving adherence
- Reducing stigma (because there is no need to take medication at school / or in the workplace)
- The risk of stimulant misuse and diversion with immediate-release preparations
- Their pharmacokinetic profiles

Consider combining immediate and modified-release preparations of stimulants to optimise effect (for example, a modified-release preparation of methylphenidate in the morning and an immediate-release preparation of methylphenidate at another time of the day to extend the duration of effect).

7.9 Monitoring and Management of Adverse Effects

Do not offer routine blood tests (including liver function tests) or to people taking medication for ADHD unless there is a clinical indication (2018). The following parameters should be monitored at initiation of methylphenidate, lisdexamfetamine, or atomoxetine, following each dose adjustment, and at least every 6 months thereafter:

- Pulse
- Blood pressure
- Appetite and weight
- Psychiatric symptoms

The following information has been compiled using the summaries of product characteristics for Strattera (atomoxetine) (Eli Lily and Company Ltd, 2021), Elvanse (lisdexamfetamine) (Shire Pharmaceuticals Ltd, 2020), and Equasym (methylphenidate) (Shire Pharmaceuticals Ltd, 2021).

Pulse

Tachycardia is listed as a common (≥1/100 to <1/10) side effect of methylphenidate, lisdexamfetamine, and atomoxetine. Average increases in heart rate are quoted for lisdexamfetamine (3-6 bpm) and atomoxetine (<10 bpm). The NICE guidelines (2018) defines tachycardia as >120 bpm, however the Adult ADHD Service recommends following the Maudsley Guidelines for Physical Health Conditions in Psychiatry (Taylor et al., 2021), which defines tachycardia as >100 bpm.

If sustained resting heart rate is >100 bpm, consider the following:

- Reducing caffeine intake (if applicable).
- Smoking cessation (if applicable).

Blood Pressure

Hypertension is listed as a common (≥1/100 to <1/10) side effect of methylphenidate, lisdexamfetamine, and atomoxetine. Average increases in blood pressure are quoted for lisdexamfetamine (2-4mmHg) and atomoxetine (<5mmHg), the SPC for methylphenidate states that changes in diastolic and systolic blood pressure of over 10mmHg are common.

Follow NICE Hypertension Pathway (2019) guidance for diagnosis of hypertension. The reference ranges used for confirmation of hypertension in the above guidance are:

- Clinic blood pressure of 140/90mmHg or higher.
  AND
- ABPM daytime average or HBPM average of 135/85mmHg or higher.

If hypertension is confirmed, consider the following:

- Reducing caffeine intake (if applicable).
- Smoking cessation (if applicable).
- Lifestyle advice around diet and exercise as suggested in NICE guideline NG136.

Appetite and Weight

Decreased appetite is listed as a very common ≥1/10) side effect of methylphenidate, lisdexamfetamine, and atomoxetine. The appetite suppressing effects of stimulants is usually transient; however, this is not the case for atomoxetine due to its long acting effects.

If appetite suppression is a problem, consider the following strategies (NICE, 2018):

- Taking medication either with or after food, rather than before meals (to avoid the appetite suppressing effects of stimulants).
- Taking additional meals or snacks early in the morning or late in the evening when stimulant effects have worn off.
- Consuming high-calorie foods of good nutritional value.
- Taking a planned break from treatment (not suitable for atomoxetine due to long acting effect).
- Obtaining dietary advice.
- Closely monitoring weight and BMI.

Psychiatric Symptoms

Serious psychiatric disturbances such as; mania, hypomania, suicidal ideation, are listed as side effects to methylphenidate, lisdexamfetamine, and atomoxetine, ranging from uncommon (≥1/1,000 to <1/100) to rare (≥1/10,000 to <1/1,000).

If a patient taking medication for ADHD experiences signs indicative of serious psychiatric illness, consider discontinuing medication and refer immediately to an appropriate urgent care provider e.g. Crisis Resolution and Home Treatment (CRHT) team or local Accident and Emergency department, and notify the Adult ADHD Service.

Mild to moderate psychiatric disturbances such as; affect lability, aggression, anxiety, depression, are listed as side effects to methylphenidate, lisdexamfetamine, and atomoxetine, ranging from common (≥1/100 to <1/10) to uncommon (≥1/1,000 to <1/100). It is important to consider that although listed as side effects, many of these findings are commonly observed in ADHD and may therefore indicate sub-optimal control of ADHD symptoms. Careful and considered evaluation is therefore important.

Some strategies that could be considered are:

- Review dose timing, ensuring doses are spaced effectively (this could involve more or less time between doses).
- Whether alternative formulations with a different release profiles (e.g. modified-release) might better suit individual circumstances (see Appendix A).
- Treating co-morbid problems such as anxiety or depression, if not thought to be medication related, or due to sub-optimal control of ADHD symptoms.

Other Side Effects and Further Management
If the above side effects persist, ensure the suggested strategies have been implemented and followed, and consider referral to Adult ADHD Service for further advice / review. Should the patient experience any other persistent or concerning side effects to methylphenidate, lisdexamfetamine or atomoxetine, the Adult ADHD Service should be contacted for advice / review when appropriate.

7.10 Ongoing Review
NICE guidelines (2018) recommend that a healthcare professional with training and expertise in managing ADHD should review ADHD medication on an annual basis. A review should consider the benefits, risks and continued need for ADHD medication, in addition to the effect of missed doses, and the effects of ADHD mediation on the wider physical and mental health of the patient. Currently there is no evidence of any significant long-term risks using stimulants. (Kooij et al., 2018).

An initial review with the Adult ADHD Service will be offered to patients who have transitioned from paediatric services, or out of area, in addition to patients who have had medications initiated by the service. Following this initial review, annual reviews should be carried out by primary care. Appendix C contains an annual review form, which may be used in primary care to offer an annual review of ADHD medication. Should there be any concerns identified during an annual review in primary care, a specialist review may be requested with the Adult ADHD Service.

7.11 Shared Care Responsibilities
Secondary Care / Adult ADHD Service Responsibilities

- Assessment and diagnosis of ADHD in adults.
- Carry out / request (when not within remit) any clinically indicated pre-treatment investigations.
- Initial prescribing and titration top optimal dose of methylphenidate / lisdexamfetamine / atomoxetine.
- Monitoring for response and side effects during titration period.
- Undertake an initial annual review (following initiation of treatment, or transition from paediatric services / out of area) to assess, benefits, side effects, risks and the continued need for treatment.
- Communicate with the patients GP to continue prescribing after dose stabilization, and to inform of any changes following medication reviews.
- Discontinuing treatment when appropriate.
- Report adverse events to the CSM / MHRA via Yellow card in the BNF, or via the website: www.yellowcard.gov.uk

Primary Care / GP Responsibilities

- Ongoing prescribing following titration and dose stabilization (on receipt of the prescribing recommendation from the Adult ADHD Service).
- Monitoring patient's blood pressure, heart rate and weight at six monthly intervals. In the event of patient non-adherence with the monitoring), the primary care team have the right to review the ongoing prescribing the ADHD medication, on notifying the Adult ADHD Service.
- Report any abnormalities or concerns that arise from the above monitoring to the Adult ADHD Service, in addition to offering relevant lifestyle interventions as suggested under 'Monitoring and Management of Adverse Effects'.

- Report adverse events to the CSM / MHRA via Yellow card in the BNF, or via the website: www.yellowcard.gov.uk

Patient / Carer Responsibilities

- Adherence with the above monitoring requirements at six monthly intervals, according to the preferred method as agreed with the GP (attendance at clinic / self-monitoring).
- To attend reviews as necessary with the Adult ADHD team.
- Report any concerns or adverse effects of the medication to the prescriber.
- Notify the psychiatrist or GP if the medication is stopped, including the reasons for this.

8. References

Beheshti, A., Chavanon, M. and Christiansen, H., 2020. Emotion dysregulation in adults with attention deficit hyperactivity disorder: a meta-analysis. *BMC Psychiatry*, 20(1).

Chang, Z., Lichtenstein, P., Halldner, L., D'Onofrio, B., Serlachius, E., Fazel, S., Långström, N. and Larsson, H. (2013). Stimulant ADHD medication and risk for substance abuse. *Journal of Child Psychology and Psychiatry*, 55(8), pp.878–885.

Cortese, S., Adamo, N., Del Giovane, C., Mohr-Jensen, C., Hayes, A.J., Carucci, S., Atkinson, L.Z., Tessari, L., Banaschewski, T., Coghill, D., Hollis, C., Simonoff, E., Zuddas, A., Barbui, C., Purgato, M., Steinhausen, H.-C., Shokraneh, F., Xia, J. and Cipriani, A. (2018). Comparative efficacy and tolerability of medications for attention-deficit hyperactivity disorder in children, adolescents, and adults: a systematic review and network meta-analysis. *The Lancet Psychiatry*, [online] 5(9), pp.727–738. Available at: https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(18)30269-4/fulltext [Accessed 20 Oct. 2019].

Daley, D., Jacobsen, R.H., Lange, A.-M, Sørensen, A. and Walldorf, J. (2019). The economic burden of adult attention deficit hyperactivity disorder: A sibling comparison cost analysis. *European Psychiatry*, 61, pp.41–48.

Dalsgaard, S., Leckman, J.F., Mortensen, P.B., Nielsen, H.S. and Simonsen, M. (2015). Effect of drugs on the risk of injuries in children with attention deficit hyperactivity disorder: a prospective cohort study. *The Lancet Psychiatry*, [online] 2(8), pp.702–709. Available at: https://www.sciencedirect.com/science/article/abs/pii/S2215036615002710 [Accessed 22 Feb. 2020].

Dey, M., Paz Castro, R., Haug, S. and Schaub, M.P. (2018). Quality of life of parents of mentally-ill children: a systematic review and meta-analysis. *Epidemiology and Psychiatric Sciences*, 28(5), pp.563–577.

Eli Lilly and Company Limited. (2021) Strattera 10mg hard capsules – Summary of Product Characteristics. emc. https://www.medicines.org.uk/emc/product/5531/smpc

General Medical Council (GMC) (2021) Prescribing Unlicensed Medicines. Available at: https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/good-practice-in-prescribing-and-managing-medicines-and-devices/prescribing-unlicensed-medicines (Accessed: 17th September 2021).

Fayyad, J., Sampson, N., Hwang, I., Adamowski, T., Aguilar-Gaxiola, S., Al-Hamzawi, A., Andrade, L., Borges, G., de Girolamo, G., Florescu, S., Gureje, O., Haro, J., Hu, C., Karam, E., Lee, S., Navarro-Mateu, F., O'Neill, S., Pennell, B., Piazza, M., Posada-Villa, J., ten Have, M.,

Torres, Y., Xavier, M., Zaslavsky, A. and Kessler, R., 2016. The descriptive epidemiology of DSM-IV Adult ADHD in the World Health Organization World Mental Health Surveys. *ADHD Attention Deficit and Hyperactivity Disorders*, 9(1), pp.47-65. Atten. Defic. Hyperact. Disord., 9 (2017), pp. 47-65

Hua, M.-H., Huang, K.-L., Hsu, J.-W., Bai, Y.-M., Su, T.-P., Tsai, S.-J., Li, C.-T., Lin, W.-C., Chen, T.-J. and Chen, M.-H. (2020). Early Pregnancy Risk Among Adolescents With ADHD: A Nationwide Longitudinal Study. *Journal of Attention Disorders*, p.108705471990023.

Jangmo, A., Stålhandske, A., Chang, Z., Chen, Q., Almqvist, C., Feldman, I., Bulik, C.M., Lichtenstein, P., D'Onofrio, B., Kuja-Halkola, R. and Larsson, H. (2019). Attention-Deficit/Hyperactivity Disorder, School Performance, and Effect of Medication. *Journal of the American Academy of Child & Adolescent Psychiatry*, [online] 58(4), pp.423–432. Available at: https://www.sciencedirect.com/science/article/pii/S0890856719300590 [Accessed 20 May 2020].

Jeffers, A.J. and Benotsch, E.G. (2016) Non-Medical Use of ADHD Stimulants for Appetite Supression and Weight Loss. Chemically Modified Bodies. Palgrave Macmillan, London. https://doi.org/10.1057/978-1-137-53535-1_9

Joint Formulary Committee (2021) British National Formulary. Available at: https://bnf.nice.org.uk/ (Accessed: 17th September 2021)

Kooij, J.J.S., Bijlenga, D., Salerno, L., Jaeschke, R., Bitter, I., Balázs, J., Thome, J., Dom, G., Kasper, S., Nunes Filipe, C., Stes, S., Mohr, P., Leppämäki, S., Casas, M., Bobes, J., Mccarthy, J.M., Richarte, V., Kjems Philipsen, A., Pehlivanidis, A. and Niemela, A. (2018). Updated European Consensus Statement on diagnosis and treatment of adult ADHD. *European Psychiatry*, 56(1), pp.14–34. https://doi.org/10.1016/j.eurpsy.2018.11.001

Mohr-Jensen, C., Müller Bisgaard, C., Boldsen, S.K. and Steinhausen, H.-C. (2019). Attention-Deficit/Hyperactivity Disorder in Childhood and Adolescence and the Risk of Crime in Young Adulthood in a Danish Nationwide Study. *Journal of the American Academy of Child & Adolescent Psychiatry*, [online] 58(4), pp.443–452. Available at: https://www.sciencedirect.com/science/article/pii/S0890856719301054 [Accessed 12 Feb. 2021].

National Institute for Health and Care Excellence (NICE) (2016) Controlled drugs: safe use and management NICE guideline [NG46] Available at: https://www.nice.org.uk/guidance/ng46

National Institute for Health and Care Excellence (NICE) (2018) Attention deficit hyperactivity disorder: diagnosis and management NICE guideline [NG87] Available at: https://www.nice.org.uk/guidance/ng87

National Institute for Health and Care Excellence (NICE) (2019) Hypertension in adults: diagnosis and management [NG136] Available at: https://www.nice.org.uk/guidance/NG136

Ruiz-Goikoetxea, M., Cortese, S., Aznarez-Sanado, M., Magallón, S., Alvarez Zallo, N., Luis, E.O., de Castro-Manglano, P., Soutullo, C. and Arrondo, G. (2018). Risk of unintentional injuries in children and adolescents with ADHD and the impact of ADHD medications: A systematic review and meta-analysis. *Neuroscience & Biobehavioral Reviews*, 84, pp.63–71.

Shire Pharmaceuticals Limited. (2020) Elvanse Adult 30mg Hard Capsules– Summary of Product Characteristics. emc. https://www.medicines.org.uk/emc/product/6828/smpc

Shire Pharmaceuticals Limited. (2021) Equasym XL 10mg Capsules – Summary of Product Characteristics. emc. https://www.medicines.org.uk/emc/product/3887/smpc#gref

Specialist Pharmacy Service (2020) Extended-release methylphenidate: A review of the pharmacokinetic profiles of available products. Available at: https://www.sps.nhs.uk/articles/extended-release-methylphenidate-a-review-of-the-pharmacokinetic-profiles-of-available-products/ (Accessed: 17th September 2021)

Sundquist, J., Ohlsson, H., Sundquist, K. and Kendler, K.S. (2014). Attention-deficit/hyperactivity disorder and risk for drug use disorder: a population-based follow-up and co-relative study. *Psychological Medicine*, 45(5), pp.977–983.

Taylor, D.M., Gaughran, F., Pillinger, T. (2021) The Maudsley Practice Guidelines for Physical Health Conditions in Psychiatry. Chichester: Wiley Blackwell.

Willcutt, E.G. (2012). The Prevalence of DSM-IV Attention-Deficit/Hyperactivity Disorder: A Meta-Analytic Review. *Neurotherapeutics*, 9(3), pp.490–499.

Young, S., Adamo, N., Ásgeirsdóttir, B.B., Branney, P., Beckett, M., Colley, W., Cubbin, S., Deeley, Q., Farrag, E., Gudjonsson, G., Hill, P., Hollingdale, J., Kilic, O., Lloyd, T., Mason, P., Paliokosta, E., Perecherla, S., Sedgwick, J., Skirrow, C. and Tierney, K. (2020). Females with ADHD: An expert consensus statement taking a lifespan approach providing guidance for the identification and treatment of attention-deficit/ hyperactivity disorder in girls and women. *BMC Psychiatry*, 20(1).

Appendix A: Pharmacokinetics of Methylphenidate Formulations

Sources used: BNF (Joint Formulary Committee, 2021), Specialist Pharmacy Service - Extended-release methylphenidate: A review of the pharmacokinetic profiles of available products (2020).

	Concerta XL® Xaggitin XL® Delmosart XL®	**Equasym XL®**	**Medikinet XL®**
Composition IR/MR	22/78	30/70	50/50
Release profile	Initial maximum concentration in 1-2 hours (from immediate release portion), second peak occurs at 6-8 hours (from modified release portion).	Initial maximum concentration in 1-2 hours (from immediate release portion), second peak occurs at 4.5 hours (from modified release portion).	Initial maximum concentration rapidly reached (from immediate release portion), second peak 3-4 hours (from modified release portion).
Approximate duration of action	12 hours	8 hours	8 hours
Administration	Taken in the morning, with or without food. Tablets must be swallowed whole, with fluid, and must not be chewed or crushed.	Taken in the morning before breakfast, with fluid. Capsules should be swallowed whole, or, opened and the contents sprinkled onto a small amount (tablespoon) of apple sauce or other similar soft food, followed by fluid. Capsule contents must not be chewed or crushed.	Taken in the morning with or after breakfast, with fluid. Capsules should be swallowed whole, or, opened and the contents sprinkled onto a small amount (tablespoon) of apple sauce or other similar soft food, followed by fluid. Capsule contents must not be chewed or crushed.
Strengths available	18mg 27mg 36mg 54mg	10mg 20mg 30mg	5mg 10mg 20mg 30mg 40mg 50mg 60mg
IR methylphenidate equivalent	Three times a day 18mg m/r = 5mg tds	Twice daily 10mg m/r = 5mg bd	Twice daily 10mg m/r = 5mg bd

Appendix B: Dosing Regimens, Licencing and Legal Status of Methylphenidate, Lisdexamfetamine, or Atomoxetine

Sources used: BNF (Joint Formulary Committee, 2021), Specialist Pharmacy Service - Extended-release methylphenidate: A review of the pharmacokinetic profiles of available products (2020).

<table>
<tr><th colspan="3"><u>Methylphenidate</u></th></tr>
<tr>
<td>Immediate Release Brands:
Generics (multiple)
Ritalin®
Tranquilyn®
Medikinet®
Modified-Release Brands:
Equasym XL®
Medikinet XL®
Concerta XL®
Xaggitin XL®
Delmosart XL®
Xenidate XL®
Significant interactions:
Risperidone, paliperidone (increased risk of dyskinesia); MAOIs (increased risk of hypertensive crisis).

Hepatic / Renal Insufficiency (where applicable)
No data – caution advised.</td>
<td>Dosage Titration:

For immediate-release formulations:
Initially 5mg bd-tds, titrated according to response (2-3 divided doses). Adjusted at weekly intervals.
Licenced max dose: 60mg
BNF recommended max dose: 100mg

For Equasym XL®, Medikinet XL®:
Initially 10mg once daily with breakfast. Adjusted at weekly intervals.
Licenced max dose: 60mg
BNF recommended max dose: 100mg

For Conerta XL®:
18mg once daily. Adjusted at weekly intervals in steps of 18mg per week. Licenced max dose: 54mg
BNF recommended max dose: 108mg

For Xaggitin XL®, Delmosart XL®, Xenidate XL®:
18mg once daily. Adjusted at weekly intervals in steps of 18mg per week. Licenced max dose: 54mg
BNF recommended max dose: 54mg</td>
<td>Drug Class and Legal Status:
Centrally acting sympathomimetics – stimulant.
Schedule 2 Controlled Drug.

Licencing Status:
Licenced for continuation only in adults.

Stopping / Discontinuing Treatment:
No specific recommendations.

Additional Info:
Xaggitin XL®, Delmosart XL® and Xenidate XL® are bioequivalent to Concerta XL®.</td>
</tr>
</table>

Lisdexamfetamine		
Brands available: • Elvanse Adult® **Significant interactions:** St John's wort, SSRIs, triptans, methadone, lithium (increased risk of serotonin syndrome); MAOIs (increased risk of hypertensive crisis); Fluoxetine, Paroxetine (predicted to increase exposure to lisdexamfetamine). **Hepatic / Renal Insufficiency (where applicable)** In patients with severe renal insufficiency (glomerular filtration rate (GFR) 15 to <30 mL/min/1.73 m2 or creatinine clearance (CrCl) <30 mL/min) the maximum dose should not exceed 50 mg/day. Further dosage reduction should be considered in patients undergoing dialysis.	**Dosage Titration:** **For Elvanse Adult®** Initially 30mg once daily. Adjusted at weekly intervals in steps of 20mg per week. Licenced max dose: 70mg BNF recommended max dose: 70mg	**Drug Class and Legal Status:** Centrally acting sympathomimetics – stimulant. Schedule 2 Controlled Drug. **Licencing Status:** Licenced for initiation and continuation adults. **Stopping / Discontinuing Treatment:** No specific recommendations.
Atomoxetine		
Brands available: • Strattera® **Significant interactions:** Bupropion, fluoxetine, paroxetine (predicted to markedly increase exposure to atomoxetine); MAOIs (increased risk of serotonin syndrome and hypertensive crisis); beta agonists (high dose only – atomoxetine is predicted to increase the risk of CV adverse effects with beta agonists). **Hepatic / Renal Insufficiency (where applicable)** For patients with moderate	**Dosage Titration** **For all formulations:** Body weight ≤70kg Initially 500mcg/kg daily, increasing after 7 days to 1.2mg/kg daily either as a single dose or in 2 divided doses. Licenced max dose: 100mg BNF recommended max dose: 1.8mg/kg or 120mg Body weight >70kg Initially 40mg daily, increasing by 20mh weekly according to response. Usual maintaincene 80-100mg daily.	**Drug Class and Legal Status:** Centrally acting sympathomimetics – non-stimulant. Prescription only medicine (POM). **Licencing Status:** Licenced for initiation and continuation adults. **Stopping / Discontinuing Treatment:** It is recommended to gradually withdraw atomoxetine to avoid withdrawal effects but may be stopped abruptly without

hepatic insufficiency (Child-Pugh Class B), initial and target doses should be reduced to 50% of the usual dose. For patients with severe hepatic insufficiency (Child-Pugh Class C), initial dose and target doses should be reduced to 25% of usual dose.	Licenced max dose: 100mg BNF recommended max dose: 1.8mg/kg or 120mg For patients with that are known CYP2D6 poor metabolisers, a lower starting dose and slower up titration of the dose may be considered to minimise the risk of adverse effects.	significant problems if indicated.

Appendix C: Annual Review of ADHD Treatment (Primary Care)

Patient Demographics	Physical Monitoring
Name:	BP (mmHg):
Date of Birth:	Pulse (bpm):
NHS Number:	Weight (Kg):

Benefits	Please Circle	
Is the medication providing sufficient benefit? *Is there evidence of impairment resulting from poor control of core symptoms?*	Yes	No
Is the patient adherent with the prescribed medication? *Explore the effects of missed doses and drug holidays and whether these are detrimental or appropriate.*	Yes	No
Is the current dosing schedule optimised? *Consider how well does the dosing schedule suits the needs of the patient.*	Yes	No
Concerns	**Please Circle**	
Are there any concerns with regards to the physical monitoring? *Hypertension, tachycardia, unintentional weight loss.*	Yes	No
Is the patient experiencing any adverse effects from their medication? *As listed in shared care protocols.*	Yes	No
Is the medication having an adverse effect on the patient's wider health? *Consider physical and mental health and note any concerns.*	Yes	No
Are there any concerns with regards to the patient's lifestyle? *Explore excessive alcohol use or substance misuse.*	Yes	No

Notes:

Review Outcome	**Please Circle**	
Continue prescribing in primary care. Consider whether additional action required e.g. seeking advice from Adult ADHD Service.	Yes	No
Withhold prescribing pending further action. Ensure additional actions are circled below e.g. seeking advice / urgent review with Adult ADHD Service.	Yes	No
Seek specialist advice from Adult ADHD Service. *Can be contacted via letter / phone / e-mail (depending on urgency).*	Yes	No
Request urgent specialist review with Adult ADHD Service. *Can be contacted via letter / phone / e-mail (depending on urgency).*	Yes	No