# CASE Learning Outcomes for Academic Levels 6, 7 and 8

The learning outcomes are designed to support programme teams in developing programmes of study to meet CASE requirements and assist clinical departments determine the level of working for staff at these academic levels.

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| **CASE Learning Outcomes** |
| **Level 6** | **Level 7** | **Level 8** |
| **Core Skills** |
| HCPC Standards of Proficiency should be adapted for ultrasound and mapped to the programme and module learning outcomes<http://www.hcpc-uk.org/publications/standards/index.asp?id=51> | Core skills are expected, as part of the original qualification in health care for those progressing from a healthcare profession background**Direct entry:** HCPC Standards of Proficiency should be adapted for ultrasound and mapped to the programme and module learning outcomes | A high level of core skills is required for anyone working at this level of practice  |
| Consideration of graduate attributes should be evident within the programme | Consideration of post-graduate attributes should be evident within the programme | Consideration of doctoral (e.g. PhD) attributes should be evident within the programme |
| **Clinical Education** |
| Carry out amedical ultrasound examination, interpret and analyse scan findings under appropriate supervision, within a defined scope of practice, safely and competently.Produce written reports, within a focused scope of practice, for ultrasound examinations undertaken  | Carry out and supervise a range of complex medical ultrasound examinations and other appropriate actions, including interpretative reporting safely, competently and independently. Provide appropriate supervision, mentorship and leadership for less experienced colleagues | Carry out and supervise a range of complex medical ultrasound examinations and other appropriate actions, including interpretative reporting safely, competently and independently. Provide leadership and consultancy within and external to the field, and quality assure reports produced by less experienced colleagues, to ensure safe, effective service delivery and guide effective patient management |
| Critically relate theory to practice in the clinical setting and nationally in order to contribute to patient diagnosis and management | Critically relate theory to practice in the clinical setting and nationally in order to contribute to patient diagnosis, management and service delivery | Critically relate theory to practice in the clinical setting, locally, nationally and internationally, in order to contribute to patient diagnosis, management and service delivery |
| Recognise the limitations of practice and the need to consult other senior colleagues. Identify sources with whom to consult in order to influence patient management  | Recognise the limitations of practice and the need to consult other senior colleagues. Identify sources with whom to consult in order to influence patient management and change practice. Engage in audit and research, present findings and make recommendations as appropriate | Recognise the limitations of practice and the need to consult other senior colleagues. Lead negotiations and research in order to influence patient management and change practise. Promote a culture that encourages audit, research and leadership |
| Critically reflect on self to demonstrate continuing professional development within clinical practice | Critically reflect on self to demonstrate continuing professional development within clinical practice and assist others in developing skills locally and nationally | Critically reflect on self to demonstrate continuing professional development within clinical practice, and lead development and review of learning locally, nationally and internationally |
| Function independently and as part of a team with critical awareness of scope i.e. extent and limitations of practice | Function independently and as part of a team, whilst developing collaborations and engaging in inter-professional team working, education and research | Lead the development of inter-professional team working, education, collaboration and research |
| Enhance the service by engaging with service users and carers to promote and improve patient- centred care  | Demonstrate originality and self- direction in tackling and solving problems, and engaging service users to promote patient-centred care | Undertake research and development, and lead educational developments to contribute substantially to tackling and solving complex and challenging problems whilst engaging service users to promote patient-centred care |
| **Science and Technology** |
| Demonstrate and apply a systematic knowledge and understanding of the physical and technological principles and processes of diagnostic ultrasound, describing their relevance to the ultrasound image and the equipment utilized | Demonstrate and apply a systematic and thorough knowledge and understanding of the physical and technological principles and processes of diagnostic ultrasound and show a comprehensive understanding of their relevance to the ultrasound image and the equipment utilized | Demonstrate and apply a thorough and critical knowledge of the physical and technological principles and processes of diagnostic ultrasound and show a comprehensive understanding of their relevance to the ultrasound image and the equipment utilized. Be able to disseminate this knowledge to learners |
| Deploy appropriate techniques to effectively produce diagnostic ultrasound images and spectra, ensuring image quality is optimised and exposure to ultrasound is minimised according to clinical need | Deploy appropriate advanced techniques to effectively produce diagnostic ultrasound images and spectra, ensuring image quality is optimised and exposure to ultrasound is minimised according to clinical need. Critically evaluate images within a wide range of complex clinical settings, implement new technology and support colleagues in the use of advanced techniques | Deploy appropriate advanced techniques to effectively produce diagnostic ultrasound images and spectra, ensuring image quality is optimised and exposure to ultrasound is minimised according to clinical need. Critically evaluate images in highly complex cases, evaluating new applications, cutting-edge technology and innovations to find solutions and drive change |
| Demonstrate proficiency in recording ultrasound images and Doppler outputs | Demonstrate proficiency in recording ultrasound images and Doppler outputs, evidencing a comprehensive understanding of the findings in relation to clinical practice | Demonstrate proficiency in recording ultrasound images and Doppler outputs, evidencing a comprehensive understanding of the findings in relation to clinical practice in complex cases |
| Critically evaluate and discuss the safety issues related to diagnostic ultrasound to enable optimal use of the equipment within the current, internationally recognised recommendations for safe practice, actively reducing any hazard to patients and staff | Critically evaluate, analyse and debate the safety issues related to diagnostic ultrasound to enable optimal use of the equipment within the current, internationally recognised recommendations for safe practice, actively reducing any hazard to patients and staff | Critically evaluate, analyse and contribute to the body of research evidence relating to safety issues in diagnostic ultrasound, to enable optimal use of the equipment within the current, internationally recognised recommendations for safe practice, actively reducing any hazard to patients and staff in a wide range of clinical cases |
| Deploy accurately established techniques of analysis and enquiry to evaluate the role of current ultrasound equipment, latest technology and associated quality assurance procedures for pertinent use to assist in the selection of new machines  | Critically appraise current ultrasound equipment, latest technology and associated quality assurance procedures for pertinent use to identify and select new machines  | Critically appraise current ultrasound equipment, latest technology and associated quality assurance procedures for pertinent use to identify and select new machines for service development and delivery of new techniques |
| Demonstrate a systematic understanding of graphical and numerical data commensurate with ultrasound practice | Develop a comprehensive understanding and utilise graphical and numerical data commensurate with ultrasound practice | Synthesise and explore complex graphical and numerical data commensurate with ultrasound practice in a range of complicated clinical situations |

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| **Professional Issues** |
| Critically evaluate the emotional impact of the ultrasound examination on the client, carers and relevant healthcare professionals and meet HCPC core proficiencies  | Critically evaluate the emotional impact of the ultrasound examination on the client, carers and relevant healthcare professionals. Demonstrate a critical awareness of clinical problems and identify potential solutions**Direct entry:** Meet HCPC core proficiencies | Critically evaluate the emotional impact of the ultrasound examination on the client, carers and relevant healthcare professionals. Demonstrate a critical awareness of clinical problems and make informed judgements when implementing improvements to care |
| Devise and sustain arguments relating to national and local legal, ethical, professional and organisational principles that underpin diagnostic ultrasound practice | Critically analyse international, national and local legal, ethical, professional and organisational principles that underpin diagnostic ultrasound practice and assist in the leadership of change | Critically analyse international, national and local legal, ethical, professional and organisational principles that underpin diagnostic ultrasound practice and provide leadership for service delivery improvements |
| Demonstrate a conceptual understanding of the changing national and local health care needs of clients, patients, carers and organisations | Critically discuss the changing national and local healthcare needs of clients, patients, carers and organisations. Suggest improvements and ways to implement change | Show self-direction and originality in tackling and solving problems associated with the changing national and local healthcare needs of clients, patients, carers and organisations and lead change |
| Identify qualitatively and quantitatively the limitations and constraints associated with ultrasound imaging | Critically evaluate qualitatively and quantitatively the limitations and constraints associated with ultrasound imaging and suggest alternative solutions to improve service provision  | Explore qualitatively and quantitatively the limitations and constraints associated with ultrasound imaging, identify and lead the implementation of alternative solutions to improve service provision |
| Demonstrate a systematic understanding of the need for life-long learning in medical ultrasound practice | Evaluate the need for life-long learning in medical ultrasound practice. Relate this to the development of self and others | Critically evaluate the need for life-long learning in medical ultrasound practice and engage in teaching, learning and assessment at a higher level |

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| Develop negotiation and time management skills to achieve the core knowledge, skills and clinical practice learning outcomes for your level of practice. Mentor and teach others | Develop negotiation and time management skills to advance knowledge, skills and clinical practice to a higher level. Mentor and teach learners, support staff and other professionals through the development of relevant learning materials | As an independent and self-critical learner, review current solutions and/or develop innovative solutions to achieve the core knowledge, skills and clinical practice learning outcomes for your level of practice. Lead and promote the education of staff, students and other groups, contributing to relevant academic programmes |
| Critically reflect on the leadership roles needed within practice and personal contributions to leadership | Critically evaluate arguments and assumptions relating to the leadership roles needed within practice and develop leadership roles within the clinical setting and at a national level. Lead a team to ensure workload is delivered effectively | Conceptualise, design and implement leadership strategies at a local, national and international level for service delivery and improvement |
| Have due regard to patients’ health status and co-morbidities, promoting healthy living | Develop, implement and review pathways of care, having regard to patients’ health status and co-morbidities, promoting healthy living  | Lead on the delivery of a whole-system, patient-centred approach rooted in multidisciplinary team working |
| Critically evaluate the effectiveness of quality assurance procedures and engage in quality monitoring within the clinical setting | Critically evaluate the effectiveness of quality assurance procedures and quality management systems. Lead on local quality delivery management and implement change as required | Conceptualise, design and implement quality assurance procedures and quality management systems. Lead on national and international quality management and implement change as required  |
| **Clinical Topic** |
| Identify, evaluate and interpret normal and abnormal anatomy and pathophysiology relevant to the level and scope of clinical practice | Identify, evaluate and interpret normal and abnormal anatomy and pathophysiology relevant to advanced clinical practice. Assess patients and make reasoned decisions to initiate, continue, modify, suspend or cease ultrasound imaging examinations | Identify, evaluate and interpret normal and abnormal anatomy and pathophysiology in highly complex cases. Exercise high levels of professional judgement and decision making in complex clinical situations |

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| Synthesise and apply scientific, ergonomic and safety principles in order to identify, select and manipulate equipment | Critically synthesise and apply scientific, ergonomic and safety principles in order to identify, select and manipulate equipment | Critically synthesise and apply scientific, ergonomic and safety principles in order to identify, select and manipulate equipment to enable safe practice and provide leadership for all users |
| Show a systematic understanding of and utilise all information from various sources to ensure the most appropriate examination is undertaken | Critically appraise and utilise all information from various sources to ensure the most appropriate examination is undertaken | Critically appraise and utilise all information from various sources to improve processes and practice and ensure the most appropriate examination is undertaken |
| Analyse the needs of the patient to perform all aspects of the ultrasound examination safely and competently | Analyse the needs of the patient to perform all aspects of the ultrasound examination safely and competently, adapting to challenging circumstances | Analyse the needs of the patient to perform all aspects of the ultrasound examination safely and competently. Provide support to others in challenging and complex circumstances  |
| Competently carry out ultrasound examinations and provide a report according to the evidence base, demonstrating an awareness of limitations within scope of practice | Competently carry out and independently report ultrasound examinations according to the evidence base, demonstrating an awareness of limitations within scope of practice | Competently carry out, supervise and support the development of independent reporting of ultrasound examinations according to the evidence base and undertake complex case-loads, demonstrating an awareness of limitations within scope of practice |
| Evaluate the ultrasound findings and, where necessary, arrange for a second opinion and/or arrange further investigations, following appropriate consultation, in line with local policies and practices | Critically evaluate the ultrasound findings and, where necessary, arrange, advise or undertake further investigations, following appropriate consultation, in line with local policies and practices. Provide support for less experienced staff | Critically evaluate the ultrasound findings within a complex case-load and, where necessary, arrange, advise or undertake further investigations, following appropriate consultation, in line with local policies and practices. Provide support, leadership and education for less experienced staff |
| Actively demonstrate proficiency in the interpretation and analysis of ultrasound appearances of organs and structures to reflect the clinical question raised and show an awareness of the limitations of level of competence. Provide a report with appropriate supervision | Actively demonstrate proficiency in providing interpretative reports for ultrasound examinations to reflect the clinical question raised. Provide support for less experienced staff | Actively demonstrate proficiency in providing interpretative reports for complex and demanding ultrasound examinations to reflect the clinical question raised. Provide support, leadership and education for less experienced staff |

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| Communicate clearly, effectively and appropriately with patients, carers and other healthcare professionals  | Communicate clearly, effectively and appropriately with patients, carers and other healthcare professionals in challenging situations. Support on-going development of communication to improve service provision | Communicate complex information clearly, effectively and appropriately with patients, carers and other healthcare professionals in challenging situations. Support and lead on-going development of communication at a local, national and international level, to improve service provision |
| Demonstrate an understanding of the principles of problem solving within the ultrasound profession in order to resolve issues in practice and service delivery | Demonstrate a comprehensive knowledge and application of the principles of problem solving within the ultrasound profession in order to resolve issues in practice and service delivery | Demonstrate a comprehensive knowledge of the principles of problem solving within the ultrasound profession in order to resolve issues in practice and service delivery. Implement, monitor and disseminate changes within practice as a result of this knowledge and understanding |
| Contribute to case management and service delivery by discussion and debate about patient diagnosis and prognosis | Contribute to case management and service delivery by discussion and debate at all levels in patient diagnosis, prognosis and management | Contribute to case management and lead service delivery innovations by discussion and debate at all levels in patient diagnosis, prognosis and management |
| Reflect on personal and professional practice in order to challenge, develop, maintain and enhance local professional standards in clinical ultrasound | Critically reflect on personal and professional practice in order to challenge, develop, maintain and enhance local and national professional standards in clinical ultrasound | Critically reflect on personal and professional practice. Synthesise and apply new approaches to challenge, develop, maintain and enhance local, national and international professional standards in clinical ultrasound |
| **Scope of Practice** |
| Demonstrate an awareness of how to take practitioner level skills to the next level, providing clear goals to work towards independent interpretative reporting practice | Demonstrate independent interpretative clinical reporting practice and show systematic and creative evidence of how the other domains of advanced practice are being used in the development of the profession | Demonstrate continuing expert clinical practice and work within all core advanced practice domains. Demonstrate evidence of creation and interpretation of new knowledge through research and advanced scholarship to extend the forefront of the ultrasound profession at a local, national and international level |

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| Apply methods and techniques to review, consolidate, extend and apply knowledge and understanding of ultrasound. Initiate and carry out projects to improve the service locally  | Deal with complex ultrasound issues both systematically and creatively, make sound judgements and communicate conclusions clearly to specialist and non-specialist audiences | Make informed judgements on complex ultrasound issues and be able to communicate ideas and conclusions clearly and effectively to specialist and non-specialist audiences |
| Synthesise, appraise and evaluate theory and research relevant to ultrasound practice in order to improve patient care. Judge the reliability, validity and significance of evidence to support conclusions and/or recommendations. Suggest reasons for contradictory data/results | Synthesise, appraise and critically evaluate complex theory and research relevant to advanced ultrasound practice in order to improve patient care and inform future practice and the profession. Judge the appropriateness of the methodologies used. Recognise and argue for alternative approaches | Undertake, synthesise, appraise and critically evaluate research relevant to advanced ultrasound practice in order to improve patient care and inform future practice and the profession. Manage complexity, incompleteness of data or contradictions in areas of knowledge |
| Develop and enhance skills in critical reflection and evaluation of theoretical concepts in order to inform and enhance personal learning and professional medical ultrasound practice | Show comprehensive understanding and critical reflection and evaluation of theoretical concepts in order to inform and enhance personal learning and professional medical ultrasound practice | Demonstrate autonomous skills in critical reflection and evaluation of theoretical concepts in order to inform and enhance personal learning, that of others and professional medical ultrasound practice in complex and unpredictable situations |
| Apply the methods and techniques learnt to assist with research projects and audit | Undertake research studies as part of a research team and present the findings locally and nationally. Autonomously plan and implement clinical audits  | Undertake and lead on pure and/or applied research at an advanced level, contributing to improving the body of evidence in ultrasound and wider professional areas |
| Plan, negotiate and manage own learning whilst developing a team approach in support of self-directed learning | Plan, negotiate and manage own learning whilst demonstrating a team approach in support of self-directed learning. Support and implement local and / or national level learning initiatives | Lead learning and development within the local, national and international setting and implement plans to increase an inter-professional team approach in support of self-directed learning |