process based targets and indicators. Process indicators such as 'advice to increase or maintain physical activity' are important since there is a large body of evidence to suggest that exercise therapy is beneficial in improving outcomes for people that suffer from chronic pain. In summary, the current project is consistent with the pragmatic approach proposed by Burns [20].

There are disadvantages associated with the introduction of targets. For instance, there is a possibility that targets may widen social inequalities [22]. The current project is central to reducing social inequalities. The findings obtained from this project could help us to understand how the QPIs work across different subgroups. This in turn could help to reduce social and geographical inequalities. Moreover, the current project recommends that pain education (e.g. educational booklets at GP practices) should be available in languages other than English. In addition, indicators such as Exercise and Activity Therapy are inexpensive to implement as most people have access to some form of physical activity. Consequently this will help to reduce inequalities. In summary, the current project takes into account the differences between more and less advantaged groups.

Systems thinking is central when it comes to the design of indicators and targets. "Systems thinking" describes the processes of developing an understanding of a system by examining the linkages and interactions between the elements that compose the entire system [20]. The indicators developed in this study have been designed to reflect the performance across the whole system they are trying to measure. First, the current project takes into account the Scottish Service Model for chronic pain [8]. Specifically, the QPIs were modelled against the four levels of the Scottish Service Model [8]. Further, this project facilitates 'system thinking' by involving different public organisations (primary, secondary and tertiary services) in the delivery of the same set of QPIs and outcome measurements. This integration is important because as suggested by Burns [20], there is a need to examine the performance of the system as a whole. Most importantly, this project will help to reduce the number of patients that use higher level services (e.g. level

8

four services) by implementing more consistent standards at all other levels. It can be concluded that this study adheres to the principles for the good design of indicators.

In summary, the current project is consistent with the key principles outlined in the review conducted by Burns [20]. It adopts a collaborative approach and focuses on pragmatism and also considers outcome based QPIs. In addition, it promotes 'systems thinking' by aiming to develop a standardised set of QPIs and a core outcome dataset across many different services in Scotland. All of these will help us to improve our understanding of how different services are working as a whole and what changes need to be made in order to improve their effectiveness.

Quality Performance Indicators (QPIs)

In accordance with the objectives of the National Outcomes project, collated information from research across the country and a literature review was used to develop evidence-based recommendations for minimum standards of pain service provision. The QPIs have been modelled against the four levels of the Scottish Service Model [23].

Quality Performance Indicators (QPIs) are a set of standards used to measure and monitor chronic pain service provision in Scotland. The aim of QPIs is to drive continuous quality improvement in the care of patients with chronic pain. QPIs are designed to be clear and measurable, based on sound clinical evidence whilst also taking into account other recognised standards and guidelines. The main source of evidence for these QPIs is SIGN 136 and the National Prescribing Strategy (which is in its final stages before publication).

The QPIs are have undergone a formal and rigorous consultation process with feedback welcome on all areas, specifically attainable and realistic targets for each indicator.

Five QPIs have been developed initially in the following areas (see Appendix 3 for QPIs in full):

1. Pain Education
2. Outcome Measures
3. Pharmacy Review
4. Service Evaluation and Audit
5. Exercise and Activity Therapies

Policy Matrix – Chronic Pain

This Matrix provides an overview of the principal policies relevant to health and social care provision in Scotland, identifying the key themes that will be addressed by good management of chronic pain. The over-arching policy is Realistic Medicine.

Shared decision making is important in the treatment of patients with chronic pain as chronic pain is a complex condition, often requiring input from a range of services, and shared decision making could lead to the best possible outcomes for patients. Services should aim to reduce unwanted harm, waste and variation in care and the Quality Performance Indicators (developed through the National Outcomes project) aims to facilitate this standardisation of care. Patients should receive a personalised approach when it comes to the treatment of chronic pain, being involved in the decision making in relation to their care and treatment. Early assessment can allow patients to be triaged to the most appropriate service for their needs. Enhancing the availability of appropriate information for relevant parties can allow services to share common issues and examples of good practice which can inform decisions on service delivery, performance and improvement. Services need to be reflective of the population they serve and changes to this population should be taken account of. Financial considerations are important as services need to ensure they are delivering services within their capacity. Finally cluster working and collaboration between services allows for improved communication between services which can benefit patients which chronic pain.

All health policies were taken from 2012 to 2018. Each of these policies cover a wide range of themes, often overlapping with each other. Chronic pain management is central to a wide range of policies and presenting it in this way can aid policy makers in identifying the gaps in current health and social care strategies.

	Realising Realistic Medicine [24]	Quality Prescribing for Chronic Pain. A Guide for Improvement. 2017-2020 [25]	eHealth Strategy 2014-2017 [26]	Effective Prescribing [27]	National Clinical Strategy [28]	AHP Delivery Plan [29]	Achieving Excellence in Pharmaceutical Care: A Strategy for Scotland [30]	Improving together: A National Framework for Quality and GP Clusters in Scotland [31]	Allied Health Professions Co-creating Wellbeing with the People of Scotland The Active and Independent Living Programme in Scotland [32]	Health and Social Care Delivery Plan [33]	Targets and Indicators in Health and Social Care in Scotland A Review [20]
Shared Decision Making.	✓		✓					✓	✓	✓	✓
Reducing Harm, Waste and Variation in Care.	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Personalised Approach to Care.	✓		✓		✓	✓	✓		✓	✓	
Early Assessment	✓	✓									
Ongoing Review	✓	✓		✓							
To enhance the availability of appropriate information for relevant parties to inform decisions on service delivery, performance	✓		✓	✓	✓	✓	✓	✓	✓		

	Realising Realistic Medicine [24]	Quality Prescribing for Chronic Pain. A Guide for Improvement. 2017-2020 [25]	eHealth Strategy 2014-2017 [26]	Effective Prescribing [27]	National Clinical Strategy [28]	AHP Delivery Plan [29]	Achieving Excellence in Pharmaceutical Care: A Strategy for Scotland [30]	Improving together: A National Framework for Quality and GP Clusters in Scotland [31]	Allied Health Professions Co-creating Wellbeing with the People of Scotland The Active and Independent Living Programme in Scotland [32]	Health and Social Care Delivery Plan [33]	Targets and Indicators in Health and Social Care in Scotland A Review [20]
and improvement.											
Demographic changes in our population.	✓				✓		✓	✓	✓		✓
Financial considerations.	✓		✓	✓	✓			✓		✓	✓
Cluster working and collaboration between services.	✓		✓			✓	✓	✓	✓	✓	✓

References

1. Smith, B.H., et al., *The Chronic Pain Grade questionnaire: validation and reliability in postal research.* Pain, 1997. **71**(2): p. 141-147.
2. Kroenke, K., et al., *Operating characteristics of PROMIS four-item depression and anxiety scales in primary care patients with chronic pain.* Pain Medicine, 2014. **15**(11): p. 1892-1901.
3. Silsbury, Z., R. Goldsmith, and A. Rushton, *Systematic review of the measurement properties of self-report physical activity questionnaires in healthy adult populations.* BMJ Open, 2015. **5**(9).
4. RAND. *36-Item Short Form Survey (SF-36).* Available from: https://www.rand.org/health/surveys_tools/mos/36-item-short-form.html.
5. Zigmond, A.S. and R.P. Snaith, *The hospital anxiety and depression scale.* Acta psychiatrica scandinavica, 1983. **67**(6): p. 361-370.
6. Spitzer, R.L., et al., *Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study.* Jama, 1999. **282**(18): p. 1737-1744.
7. Spitzer, R.L., et al., *A brief measure for assessing generalized anxiety disorder: the GAD-7.* Archives of internal medicine, 2006. **166**(10): p. 1092-1097.
8. McNair, D.M., M. Lorr, and L.F. Droppleman, *Profiles of mood states.* San Diego: Educational and Industrial Testing Services, 1971.
9. Gillanders, D.T., et al., *The development and initial validation of the cognitive fusion questionnaire.* Behav Ther, 2014. **45**(1): p. 83-101.
10. Evans, J.M.-C.F.M.M.B.K.A.J.C.G.M.C., *CORE: Clinical Outcomes in Routine Evaluation.* Journal of Mental Health, 2000. **9**(3): p. 247-255.
11. Neff, K.D., *The development and validation of a scale to measure self-compassion.* Self and identity, 2003. **2**(3): p. 223-250.
12. Cleeland, C.S. and K.M. Ryan, *Pain assessment: global use of the Brief Pain Inventory.* Ann Acad Med Singapore, 1994. **23**(2): p. 129-38.
13. Kerns, R.D., D.C. Turk, and T.E. Rudy, *The West Haven-Yale Multidimensional Pain Inventory (WHYMPI).* Pain, 1985. **23**.
14. Fairbank, J.C., et al., *The Oswestry low back pain disability questionnaire.* Physiotherapy, 1980. **66**(8): p. 271-3.
15. Roland, M. and R. Morris, *A study of the natural history of back pain. Part I: development of a reliable and sensitive measure of disability in low-back pain.* Spine (Phila Pa 1976), 1983. **8**.
16. EuroQol, G., *EuroQol--a new facility for the measurement of health-related quality of life.* Health policy (Amsterdam, Netherlands), 1990. **16**(3): p. 199.
17. Ashworth, M., et al., *Measuring mental health outcomes in primary care: the psychometric properties of a new patient-generated outcome measure,'PSYCHLOPS'('psychological outcome profiles').* Primary care mental health, 2005. **3**(4).
18. Mundt, J.C., et al., *The Work and Social Adjustment Scale: a simple measure of impairment in functioning.* The British Journal of Psychiatry, 2002. **180**(5): p. 461-464.
19. NHS England. *The NHS Friends and Family Test (FFT).* Available from: https://www.nhs.uk/NHSEngland/AboutNHSservices/Pages/nhs-friends-and-family-test.aspx.
20. Burns, H., *Targets and Indicators in Health and Social Care in Scotland. A Review.* The Scottish Government 2017.

21. Berry, N., T. Gardner, and I. Anderson, *On targets: how targets can be most effective in the English NHS*. 2015: Health Foundation.

22. Elkan, R. and J. Robinson, *The use of targets to improve the performance of health care providers: a discussion of government policy*. Br J Gen Pract, 1998. **48**(433): p. 1515-1518.

23. Healthcare Improvement Scotland, *Chronic Pain Services in Scotland: Where are we now?* 2014.

24. The Scottish Government, *Chief Medical Officer's Annual Report 2015-16: Realising Realistic Medicine*. 2017.

25. The Scottish Government, *Quality Prescribing for Chronic Pain. A Guide for Improvement 2017-2020*. 2018.

26. The Scottish Government, *eHealth Strategy 2014-2017*. 2015.

27. The Scottish Government, *Effective Prescribing* 2015.

28. The Scottish Government, *A National Clinical Strategy for Scotland*. 2016.

29. The Scottish Government, *AHPs as agents of change in health and social care. The National Delivery Plan for the Allied Health Professions in Scotland, 2012–2015*. 2012.

30. The Scottish Government, *Achieving Excellence in Pharmaceutical Care: A Strategy for Scotland*. 2017.

31. The Scottish Government, *IMPROVING TOGETHER: A National Framework for Quality and GP Clusters in Scotland* 2017.

32. The Scottish Government, *Allied Health Professions Co-creating Wellbeing with the People of Scotland. The Active and Independent Living Programme in Scotland*. 2017.

33. The Scottish Government, *Health and Social Care Delivery Plan*. 2016.

34. Crichton, N., *Visual analogue scale (VAS)*. J Clin Nurs, 2001. **10**(5): p. 706-6.

35. Nicholas, M.K., *Pain self efficacy questionnaire (PSEQ)*. Summary of psychometric properties from original Westmead hospital sample (1986e87). Sydney: University of Sydney Pain Management and Research Centre, 1994.

36. Little, P., et al., *Should We Give Detailed Advice and Information Booklets to Patients With Back Pain?: A Randomized Controlled Factorial Trial of a Self-Management Booklet and Doctor Advice to Take Exercise for Back Pain*. Spine, 2001. **26**(19): p. 2065-2072.

37. Scottish Intercollegiate Guidelines Network, *Management of chronic pain*. SIGN 136, 2013.

38. LeFort, S.M., et al., *Randomized controlled trial of a community-based psychoeducation program for the self-management of chronic pain*. Pain, 1998. **74**(2-3): p. 297-306.

39. Trouvin, A., et al., *Assessing the Benefit of an Educational Program in a Rehabilitation Program over a Week in 99 Patients with Chronic Low Back Pain*. J Nov Physiother, 2016. **6**(286): p. 2.

40. Geneen, L.J., et al., *Effects of education to facilitate knowledge about chronic pain for adults: a systematic review with meta-analysis*. Systematic reviews, 2015. **4**(1): p. 1.

41. The Scottish Government, *Quality Prescribing for Chronic Pain: A Guideline for Improvement 2017-2020*. 2018.

42. The British Pain Society, *Guidelines for Pain Management Programmes for adults. An evidence-based review prepared on behalf of the British Pain Society* 2013.

43. National Pain Audit Final Report 2010–2012. Available at: www.nationalpainaudit.org/media/files/NationalPainAudit-2012.pdf: Dr Foster Intelligence, British Pain Society, Healthcare Quality Improvement Partnership;.

44. The Faculty of Pain Medicine, *Key Pain Management Standards for CQC inspection frameworks*.

45. Treede, R.-D., et al., *A classification of chronic pain for ICD-11*. Pain, 2015. **156**(6): p. 1003.

46.   NHS Scotland, *NHS Scotland Waiting Time Guidance*. 2012.
47.   Kylasov, A. and S. Gavriv, *Diversity Of Sport: non-destructive evaluation.*, in *Encyclopedia of Life Support Systems*. 2011, UNESCO: Paris. p. 462-491.
48.   World Health Organisation. *Physical Activity*. 2017; Available from: http://www.who.int/topics/physical_activity/en/.
49.   Geneen, L.J., et al., *Physical activity and exercise for chronic pain in adults: an overview of Cochrane Reviews.* The Cochrane Library, 2017.
50.   Daenen, L., et al., *Exercise, Not to Exercise, or How to Exercise in Patients With Chronic Pain? Applying Science to Practice.* The Clinical Journal of Pain, 2015. **31**(2): p. 108-114.

Appendices

Appendix 1: How the data collected in NHS Lothian, Tayside and Fife matches onto the Core Minimum Dataset

Questionnaires	NHS Tayside	Core Minimum Dataset
Pain Severity	Brief Pain Inventory (BPI) [12]	Question 1 of the Chronic Pain Grade Questionnaire (CPG) [1]
Functional Impact	Brief Pain Inventory (BPI)-question 9(A) [12]	Question 5 of the Chronic Pain Grade Questionnaire (CPG) [1]
Emotional Impact	Hospital Anxiety and Depression Scale (HADS) [5]	Patient Health Questionnaire-2 (PHQ-2) [2]
Health - Related Quality of Life	Clinic questionnaire : Question number 9(G) from BPI [12] asks about enjoyment of life. Research questionnaire: EuroQol Five Dimensions Questionnaire (EQ-5D) [16]	Question 1 of the Short Form Health Survey (SF-36) [4]

Questionnaires	NHS Lothian	Core Minimum Dataset
Pain Severity	Brief Pain Inventory (BPI) [12]	Pain Severity: Question 1 of the Chronic Pain Grade Questionnaire (CPG) [1]
Functional Impact	Brief Pain Inventory (BPI) [12]	Question 5 of the Chronic Pain Grade Questionnaire (CPG) [1]
Emotional Impact	Hospital Anxiety and Depression Scale (HADS) [5]	Patient Health Questionnaire-2 (PHQ-2) [2]
Health - Related Quality of Life	EuroQol Five Dimensions Questionnaire (EQ-5D) [16]	Health-Related Quality of Life: Question 1 of the Short Form Health Survey (SF-36) [4]

Questionnaires	NHS Fife	Core Minimum Dataset
Pain Severity	Visual analogue scale (VAS) [34]	Pain Severity: Question 1 of the Chronic Pain Grade Questionnaire (CPG) [1]
Functional Impact	Pain Self-Efficacy Questionnaire (PSEQ) [35]	Question 5 of the Chronic Pain Grade Questionnaire (CPG) [1]
Emotional Impact	Patient health questionnaire - 9 (PHQ-9) [6]	Patient Health Questionnaire-2 (PHQ-2) [2]
Health - Related Quality of Life	Not recorded.	Health-Related Quality of Life: Question 1 of the Short Form Health Survey (SF-36) [4]

Appendix 2: Core Minimum Dataset[1]

Demographics

1) Today's date

_____

2) CHI Number

_____

3) Age

☐ 18 - 24 years old

☐ 25 - 34 years old

☐ 35 - 44 years old

☐ 45 - 54 years old

☐ 55 - 64 years old

☐ 65 - 74 years old

☐ 75 years or older

4) Gender

☐ Female

☐ Male

☐ Non-binary/ third gender

☐ Prefer to self-describe

_____

☐ Prefer not to say

5) Postcode

_____

[1] Version 2 – 16/02/2018

6)Pain Duration

☐ Less than 3 months

☐ More than 3 but less than 6 months

☐ More than 6 but less than 12 months

☐ More than 1 but less than 3 years

☐ More than 3 but less than 6 years

☐ More than 6 but less than 10 years

☐ More than 10 years

7)Pain Severity

In the past six months, on average, how intense was your pain rated on a 0-10 grade scale where 0 is "no pain" and 10 is "pain as bad as it could be".

☐ 0
No
Pain
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10
Pain as
bad as it
could be.

8)Emotional Impact

Please circle the options that apply to you.

Over the past 2 weeks, how often have you been bothered by any of the following problems?	Not At All	Several Days	More Than Half the Days	Nearly Every Day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3

9)Functional Impact

In the past six months, how much has this pain interfered with your daily activities rated on a 0-10 scale where 0 is "no interference" and 10 is "unable to carry on activities"

☐ 0
No
interference

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10
Unable
to carry
on
activities