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Australia and New Zealand Horizon Scanning Network

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Horizon Scanning Technology Prioritising Summary

The targeted screening and eradication of *Helicobacter pylori*

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PRIORITISING SUMMARY

REGISTER ID: **000415**

NAME OF TECHNOLOGY: **SCREENING AND ERADICATION OF *HELICOBACTER PYLORI***

PURPOSE AND TARGET GROUP: **TARGETED ERADICATION OF *H PYLORI* IN PATIENTS AT RISK OF DEVELOPING GASTRIC CANCER.**

STAGE OF DEVELOPMENT (IN AUSTRALIA):

- ☒ Yet to emerge
- ☐ Experimental
- ☐ Investigational
- ☐ Nearly established
- ☐ Established
- ☐ Established *but* changed indication or modification of technique
- ☐ Should be taken out of use

AUSTRALIAN THERAPEUTIC GOODS ADMINISTRATION APPROVAL

- ☐ Yes — ARTG number
- ☐ No
- ☒ Not applicable

INTERNATIONAL UTILISATION:

COUNTRY	LEVEL OF USE		
	Trials Underway or Completed	Limited Use	Widely Diffused
Japan		✓	
Korea		✓	
Taiwan		✓	

IMPACT SUMMARY:

Screening for *Helicobacter pylori* could be provided to high risk populations using existing infrastructure and diagnostic tests within Australia. Following identification of infected individuals, eradication of the pathogen could be performed which may reduce the risk of gastric cancer.

BACKGROUND

Currently screening for *H pylori* does not occur at a state or national level within Australia. *H pylori* may cause gastritis and peptic ulcers and a progression from these ailments may lead to gastric cancer. Much of the world's burden of gastric cancer is thought to be caused by *H pylori* (Fock et al 2008). Since the discovery of *H pylori* as a causative agent of cancer, effective therapies have been developed aimed at

eradicating *H pylori*, usually consisting of two antibiotics and a proton pump inhibitor[1] taken in combination. Vaccines against *H pylori* are in development in several laboratories. There are currently calls in the medical literature to investigate the role of screening for *H pylori* with the aim of eradicating it in certain populations and preventing gastric cancer (Talley 2008).

CLINICAL NEED AND BURDEN OF DISEASE

The prevalence of *H pylori* in Australia varies with the population tested. A general epidemiological study found that across a wide subset of the Australian population the prevalence was 15.4 per cent (Moujaber et al 2008). Previous studies in smaller and more local populations found that the prevalence was as high as 38 per cent in an Anglo-Celtic population residing in Melbourne (Lin et al 1998) and 76 per cent in a Western Australian aboriginal population (Windsor et al 2005).

Stomach cancer incidence has been in decline in developed countries for several decades and Australia is no exception to this. From 1983 to 2003 the age standardised incidence of stomach cancer has dropped from 15.8 to 9.2 per 100,000 population. This drop may be attributed to improved living standards reducing the prevalence of *H. pylori* with an increase in fruit and vegetable consumption combined with a reduced intake of salt and smoke preserved food (AIHW 2007; Fock et al 2008).

DIFFUSION

No evidence of systematic screening of populations in Australia was identified.

COMPARATORS

The vast majority of Australian's infected with *H pylori* are asymptomatic and therefore the most likely path of *H pylori* diagnosis is serendipitous discovery during routine investigations for other conditions (Correa & Piazuelo 2008).

SAFETY AND EFFECTIVENESS ISSUES

Several trials have investigated the impact of screening for and eradication of *H pylori* on the development of gastric cancer. Due to the long term and multifactorial nature of gastric cancer development most studies investigate surrogate markers for cancer development, e.g. gastric atrophy, intestinal metaplasia and dysplasia. This allows much shorter follow-up periods and smaller study populations, yet may not be as accurate as direct long term investigations of gastric cancer.

A trial involving 10,537 non-selected subjects investigated the effects of both screening for, and eradication of, *H pylori*. Screening for *H pylori* was performed with the ^{13}C urea breath test. Primary outcomes assessed were dyspepsia[2] consultation

[1] Proton pump inhibitors act to inhibit the stomach's acid secretory pathways and thus reduce the amount of acid in the stomach.
[2] Impairment of digestion

rates over two years. Secondary outcomes were dyspepsia symptoms, resource use, healthcare system costs, and quality of life over the same time period. Of the 10,537 screened 8,901 were negative and did not receive further medical attention. After exclusions, 1,558 of the remaining 1,636 were randomised to either a drug based intervention (ranitidine bismuth citrate (400 mg) and clarithromycin (500 mg) twice daily for 14 days; n=787) or a placebo for the same time period (n=771). Primary outcomes were assessed for 782 (99%) of the intervention group and for the entire placebo group. The intervention group had a reduction of 35 per cent (55 vs. 78) in the number of consultations for dyspepsia compared to the placebo group (p=0.021). There was an increased cost in the intervention group of £84.70 compared to the placebo group, of which £83.40 was the cost of the eradication therapy. There were no significant differences reported for quality of life between the intervention and placebo groups. The study authors concluded that the eradication of *H pylori* was effective at reducing dyspepsia but this needs to be balanced against the increased cost of medication to the health care system (Lane et al 2006) (Level II intervention evidence).

A study investigating the impact of individuals knowing their *H pylori* status was carried out on the *H pylori* negative subjects from a screening trial. The *H pylori* negative subjects (n=2,780) were randomised to either placebo "eradication therapy" (n=1,353) or informed of their negative status (n=1,355). After two years there was a reduction in dyspepsia related costs to the health care system, with a mean saving of £11.08 (95% CI [£3.52, £25.56]) in those subjects who were informed of their *H pylori* negative status compared to the patients given placebo therapy and unaware of their *H. pylori* status. There was also a reduction in the absolute number of subjects who sought any dyspepsia related medical attention with 172 (13%) of status aware subjects having any dyspepsia related costs compared to 212 (16%) of placebo treated subjects. The relative risk of incurring costs was 0.81 (95% CI [0.67, 0.97]) for the informed patients. This indicates that there are savings to be gained from an individual being made aware that they are *H pylori* negative (Ford et al 2007) (Level II intervention evidence).

The studies presented here show that there may be significant dyspepsia related savings made when screening and eradication of *H pylori* is carried out in a population. There are indications that these savings may be balanced out by the increased costs due to the screening and eradication therapy but further research is required. Additionally, whether these shorter term positive results translate into reductions in malignancies is not able to be assessed currently.

COST IMPACT

A recent Australian paper reported that anti-ulcer treatments in Australia are a very significant health care system burden, costing 11.1 per cent of the pharmaceutical

benefits scheme budget in 1999. Anti-ulcer drugs represented 6.1 per cent of prescriptions compared to *H. pylori* eradication therapy representing 1.3 per cent of prescriptions (Moujaber et al 2008).

A ten year follow-up study investigated the health costs in a prospectively recruited population of 8,407 people. Of these subjects 2,324 tested positive for *H pylori* and were randomised to the intervention group (n=1,161) or the placebo group (n=1,163). Ten years after the end of the eradication therapy 919[3] (40%) agreed to allow analysis of their records for the purposes of the study. There was a reduction of dyspepsia related costs at 10 years of $US117 (95% CI [$11, $220]; *p*=0.03). This reduction was greater than the original costs of screening and eradication treatment. A non-significant trend of reduced symptomatic dyspepsia at 10-years was observed in the intervention group. No malignancies were reported in either group analysed at 10-years (Ford et al 2005) (Level II intervention evidence).

ETHICAL, CULTURAL OR RELIGIOUS CONSIDERATIONS

No issues were identified/raised in the sources examined.

OTHER ISSUES

No issues were identified/raised in the sources examined.

SUMMARY OF FINDINGS

H pylori screening and eradication programmes may facilitate a reduction in dyspepsia related symptoms and may also give cost savings over the long term. A long-term study reported a reduction in health care system costs which was greater than the initial outlay for screening and eradication. No evidence supporting the hypothesis that the eradication of *H. pylori* can prevent cancer was identified. Long-term follow up studies are required.

HEALTHPACT ACTION:

Given the potential links to gastric cancer and lymphoma, HealthPACT recommended that a Horizon Scanning report be commissioned, combining an assessment of rapid testing for *Helicobacter pylori* and screening for *Helicobacter pylori* in targeted populations.

NUMBER OF INCLUDED STUDIES

Total number of studies	
Level II intervention evidence	3

REFERENCES:

AIHW (2007). *Cancer in Australia: an overview, 2006,* Australian Institute of Health and Welfare.http://www.aihw.gov.au/publications/can/ca06/ca06.pdf

[3] It was not stated what proportion of these subjects were from which arm of the trial

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Ford, A. C., Forman, D. et al (2005). 'A community screening program for Helicobacter pylori saves money: 10-year follow-up of a randomized controlled trial', *Gastroenterology,* 129 (6), 1910-1917.

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Lane, J. A., Murray, L. J. et al (2006). 'Impact of Helicobacter pylori eradication on dyspepsia, health resource use, and quality of life in the Bristol helicobacter project: randomised controlled trial', *BMJ,* 332 (7535), 199-204.

Lin, S. K., Lambert, J. R. et al (1998). 'Prevalence of Helicobacter pylori in a representative Anglo-Celtic population of urban Melbourne', *J Gastroenterol Hepatol,* 13 (5), 505-510.

Moujaber, T., Macintyre, C. R. et al (2008). 'The seroepidemiology of Helicobacter pylori infection in Australia', *Int J Infect Dis,* 12 (5), 500-504.

Talley, N. J. (2008). 'Is it time to screen and treat H pylori to prevent gastric cancer?' *Lancet,* 372 (9636), 350-352.

Windsor, H. M., Abioye-Kuteyi, E. A. et al (2005). 'Prevalence of Helicobacter pylori in Indigenous Western Australians: comparison between urban and remote rural populations', *Med J Aust,* 182 (5), 210-213.

SEARCH CRITERIA TO BE USED:

Helicobacter Infections/ drug therapy/economics

Helicobacter pylori

Peptic Ulcer/ drug therapy/economics/microbiology

Cost-Benefit Analysis

Dyspepsia/diagnosis/economics/etiology