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Author/s:

Koplin, JJ;Turner, MR;Savulescu, J

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The Duty to Look for Incidental Findings in Imaging Research

JULIAN J. KOPLIN, MARTIN R. TURNER, AND JULIAN SAVULESCU

ABSTRACT Imaging research regularly yields incidental findings that may have personal medical or reproductive decision-making significance to study participants. It is widely assumed that researchers have a moral obligation to disclose at least some kinds of incidental findings to research participants. However, it is also a widely held view that researchers do not have a moral obligation to actively look for abnormalities irrelevant to the aims of their study. This paper challenges that assumption.

KEYWORDS incidental findings, imaging research, return of research results, human subjects research

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Imaging technologies are playing a major role in biomedical research today. Some recent research initiatives—such as the U.K. Biobank Imaging study, the BRAIN Initiative based in the United States, and the German National Cohort MRI Study—involve scanning the brains of tens or hundreds of thousands of healthy research participants.¹ Many of the scans will yield incidental findings—that is, a “finding concerning an individual research participant that has potential health or reproductive importance and is discovered in the course of conducting research but is beyond the aims of the study.”² In brain imaging research, unexpected abnormalities are found in roughly 3% of healthy participants; in other kinds of imaging research, the rate of the occurrence of incidental findings can be much higher.³ Despite the scope of the problem, existing legal and ethical guidelines for the management of incidental findings are often vague or unclear; perhaps because of this ambiguity, researchers and research institutions manage incidental findings in a wide variety of ways.⁴

To date, much of the bioethical literature on incidental findings has sought to determine *what kinds* of incidental findings should be disclosed to participants.

There is an emerging consensus that incidental findings should be disclosed in at least those cases in which disclosure offers clear medical benefits to the participant and the participant consents to receive the information.⁵ Admittedly, it can be difficult to determine which findings meet these criteria. There is a dearth of information on the medical significance of many kinds of incidental findings in asymptomatic individuals, let alone the psychosocial ramifications of receiving this information. Accordingly, the value of early diagnosis and treatment is often unclear.⁶ Moreover, although most commentators agree that incidental findings should be disclosed when they reveal conditions that have clear adverse implications for future health, whether incidental findings should be disclosed *only* when they meet these criteria is an open question. Some argue that researchers should disclose any findings that could promote the well-being of participants (including findings that are not medically actionable but could guide life planning and reproductive decisions),⁷ and others argue that researchers should disclose any findings that the participants either can be expected to comprehend or give consent to receive.⁸ Despite these areas of controversy,

there is a growing area of agreement: most commentators think that researchers ought to disclose information that could offer clear medical benefits to research participants should such information emerge over the course of the study.

The idea that researchers ought to disclose certain categories of findings that are identified inadvertently as part of the regular components of the research study design leaves open the question of whether researchers ought to actively look for such findings—or, conversely, whether they should avoid doing so. Whether researchers have an obligation to look (or avoid looking) has important implications for how research is designed; there are a range of strategies that researchers can adopt to either increase or decrease the detection of incidental findings (see table 1). Current strategies to increase the yield of incidental findings include training radiographers to identify and flag certain kinds of abnormalities, subjecting all research scans to review by a qualified radiologist, and taking diagnostic-quality images as part of the study.⁹ In the future, it might become possible to use artificial intelligence and deep learning to further increase the identification of incidental findings. Strategies to decrease the yield of incidental findings include reducing the image field of view,¹⁰ digitally “filtering out” aspects of the image unrelated to the specific abnormalities being looked for,¹¹ or simply discouraging researchers and radiographers from looking for abnormalities while taking scans.¹² The strategies adopted by researchers or institutions can have a significant impact on how many incidental findings are discovered and reported to participants. This, in turn, could have a significant impact

on the well-being of some research participants, in the sense that being informed (or not informed) of an incidental finding could affect participants’ morbidity, mortality, reproductive decision-making, and general ability to plan for the future. Nonetheless, ethical guidelines often fail to specify whether researchers should adopt any of these measures or, more generally, the extent to which researchers should actively look (or actively avoid looking) for incidental findings.¹³

Given the impact on research participants, it is important to consider not only whether researchers ought to disclose incidental findings that happen to be discovered but also whether researchers ought to look for such findings through the course of the research. On the face of it, a duty to disclose incidental findings might seem to go hand in hand with a duty to look for such findings; both duties serve to provide research participants with information relevant to their health. Yet unlike the duty to disclose incidental findings, the idea of a duty to look for incidental findings has attracted less support; indeed, much of the extant bioethics literature on the topic claims that researchers do not have such a duty. To list a few examples: the Presidential Commission for the Study of Bioethical Issues holds that “researchers have no general duty to look for secondary findings”¹⁴ (although the Commission holds that they can, in some circumstances, justifiably choose to do so); a working group supported by the National Institutes of Health has concluded that researchers “generally have no obligation to act as clinicians and affirmatively search for IFs [incidental findings]”;¹⁵ Miller and colleagues argue that an affirmative responsibility to look for incidental

Table 1.
Potential Strategies to Influence the Detection of Incidental Findings

Strategies to increase the detection of incidental findings	• Instruct researchers who carry out scans to systematically check for incidental findings. • Explicitly train research-based radiographers to identify and flag (at least some categories of) incidental findings. • Subject all research scans to review by a qualified radiologist, which may require researchers to obtain diagnostic-quality scans alongside research images even if unnecessary to achieve the aims of the study. • Develop automated image-processing tools to search for incidental findings.
Strategies to decrease the detection of incidental findings	• Discourage researchers and research-based radiographers from looking for or speculating on incidental findings irrelevant to the research questions. • Reduce image field of view to only those areas relevant to the research.

findings “goes beyond the ethical obligations inherent in the investigator-subject relationship”;¹⁶ and Richardson argues that designing research to help detect incidental findings is not merely supererogatory but also *prima facie* unethical.¹⁷ Others go even further. One line of argument (originally developed in the context of genomic research) suggests that researchers should circumvent the ethical dilemmas associated with incidental findings by actively minimizing the chance that such findings will be discovered.¹⁸

This article defends the opposite view. We argue that researchers have a moral duty to look for incidental findings, although this duty is limited in both its strength and scope. We defend this position by considering whether the ethical underpinnings of the duty to disclose incidental findings can also support a duty to intentionally look for them. Specifically, we argue that the duty of easy rescue—the moral obligation to (attempt to) prevent grave harms to others when we can do so at a small cost to ourselves—can ground both a duty to disclose incidental findings and a duty to seek them out.

First, however, it is worth emphasizing what this article is *not* about. We do not attempt to define the range of findings that should be reported to participants. This is a difficult question, in part because the benefits versus risks of disclosing incidental findings can be highly uncertain. The natural course of illness or disability associated with many incidental findings is unknown. Data from the medical context (which involves symptom-based investigations) does not translate straightforwardly to the research context; in the latter context, there is often little information on the long-term natural history of abnormalities discovered in asymptomatic individuals.¹⁹ In a certain range of cases, then, the benefits of disclosing incidental findings to participants may be too uncertain to justify such disclosure—let alone to justify seeking such information out.

Although we think that there are important unresolved questions regarding the kinds of findings that should be communicated to participants, this article takes no position on what range of incidental findings ought to be disclosed to them; we are merely arguing in favor of looking for incidental findings that *should* be reported to participants, whatever that range is determined to be. The German National Cohort MRI

Study²⁰ and the U.K. Biobank Imaging Study²¹ have already developed lists of potentially serious findings to report to participants. These lists were jointly developed by radiologists, clinicians, ethicists, and epidemiologists, and they are subject to ongoing review. They provide a useful test case for our argument. If researchers ought to disclose findings that are on respected lists of reportable incidental findings, then—according to our argument—they also ought to actively look for these potential abnormalities. In other words, we are arguing that if researchers have a moral reason to disclose certain kinds of incidental abnormalities, they also have a moral reason to design research to help detect these (but perhaps *only* these) abnormalities.

In making this argument, we assume that the process used to communicate incidental findings is itself ethical. It is important that participants are informed of the possibility of incidental findings during the consent process, that they are made aware of the negative implications receiving this information could have with respect to insurance and employment, and that the uncertain significance of particular findings is made clear. However, we will not attempt to provide a complete account of how incidental findings should be communicated. This article focuses squarely on the processes used to detect incidental findings, not the processes used to communicate them.

Relatedly, we will not attempt to answer the question of whether research participants should be able to decide *not* to receive clinically significant incidental findings, should they be discovered.²² This is clearly an important ethical question, but it is independent of the issue we address here, and we think it is best addressed separately. We will need to decide whether to intentionally seek out incidental findings (at least for participants who wish to be informed of them) regardless of whether participants are able to opt out of receiving this information.

Nor do we discuss researchers’ ancillary care obligations in this article. Ancillary care obligations are moral obligations, held by medical researchers, to provide research subjects with medical care that is not related to the purposes of the study. These ancillary care obligations are thought to arise because research subjects entrust researchers with information that would otherwise have remained private. Researchers, in turn, incur

special moral responsibilities to look after health needs they discover by accessing research subjects' private information.²³ The ancillary care framework can be adapted to the topic of incidental findings as follows: because research subjects entrust researchers with their private information, researchers ought to disclose incidental findings as a kind of compensation for the relaxation of participants' privacy rights.²⁴ Although the ancillary care framework recommends that researchers disclose beneficial information discovered while carrying out a study's procedures, it does not require researchers to adjust the study design to increase the yield of incidental findings. In fact, the ancillary care framework arguably weighs against doing so, as measures taken to increase researchers' chance of discovering incidental findings would often compound the breach to participants' privacy.²⁵

As explained further below, we understand the duty to disclose incidental findings in terms of the duty of easy rescue, not in terms of researchers' ancillary care obligations. However, our argument is not necessarily incompatible with the ancillary care framework. This is because researchers' ancillary care obligations do not exhaust the scope of their moral obligations. Even if a duty to look for incidental findings cannot be justified as compensation for the relaxation of patients' privacy rights, researchers may have moral obligations toward research participants that are separate from their ancillary care obligations. These other moral obligations include duties shared by all moral agents. One such moral obligation is the duty of easy rescue, which is not exclusive to the research or clinical environment and is owed toward all people (including people one does not have a preexisting relationship with). The duty of easy rescue can ground an obligation to actively look for incidental findings. Or so we shall argue.

THE DUTY TO DISCLOSE

It is widely accepted that our moral duties include some duties of beneficence, that is, duties to promote the well-being of others. Yet it is widely believed that our duties of beneficence are relatively limited; morality is not usually thought to require us to make extreme sacrifices to benefit others. However, we are at least *sometimes* required to act beneficently. How far, then, do our duties of beneficence extend? One of the least

controversial examples of a duty of beneficence is the duty of easy rescue.

Jeremy Bentham has outlined three famous scenarios where a duty of easy rescue clearly seems to apply: "A woman's head-dress catches fire: water is at hand: a man, instead of assisting to quench the fire, looks on, and laughs at it. A drunken man, falling with his face downwards into a puddle, is in danger of suffocation: lifting his head a little on one side would save him: another man sees this and lets him lie. A quantity of gunpowder lies scattered about a room: a man is going into it with a lighted candle: another, knowing this, lets him go in without warning."²⁶ Peter Singer has outlined an-

The duty of easy rescue and the duty to look are two sides of the same coin. If researchers have a (limited) moral duty to disclose incidental findings when doing so would benefit participants, then they also have a (limited) moral duty to seek out such findings.

other: "[I]f I am walking past a shallow pond and see a child drowning in it, I ought to wade in and pull the child out. This will mean getting my clothes muddy, but this is insignificant, while the death of the child would presumably be a very bad thing."²⁷

In each scenario, the bystander has a positive moral obligation to try to prevent an imminent disaster. The bystander is not responsible for the plight of the endangered party and does not stand in any special relationship to this person. Even so, the bystander has a clear moral duty to try to avert the potential harm.²⁸

One reason that researchers have a duty to disclose some kinds of incidental findings is because they, like all moral agents, have a moral duty to perform easy rescues. If disclosing an incidental finding might avert serious harm to the participant, and if disclosing this information does not require any major sacrifices on the part of the research team (for example, in terms of time

or resource costs), then, according to the duty of easy rescue, this information ought to be disclosed.

Our argument so far should be relatively uncontroversial. Indeed, duties of easy rescue are widely cited as a reason to disclose incidental findings to research participants, especially in the related context of genomic research.²⁹ However, there is one lingering challenge for those who appeal to the duty of easy rescue: that of defining the duty's scope. At one extreme, duties of easy rescue might be interpreted extremely broadly, such that we should seek to avert serious harms whenever it is possible to do so at comparatively little cost to ourselves. Broad duties of easy rescue are not limited to rare circumstances where (for example) we encounter children drowning in ponds; they also require us to donate much of our money and devote much of our energy to causes such as famine relief, as this, too, will enable us to save others at comparatively little cost to ourselves.³⁰ Broad duties of easy rescue are consistent with the view that researchers should disclose certain types of incidental findings, but—counterintuitively—they seem to place this obligation on a par with researchers' obligations to donate personal income to effective charities.³¹ At the other extreme, duties of easy rescue might be interpreted extremely narrowly. One narrow version of the duty of easy rescue requires us to act only if there is a clear opportunity to directly avert an *imminent* risk of serious harm at minimal cost.³² This version of the duty of easy rescue would require researchers to disclose incidental findings in cases where disclosure would avert a definite and imminent disaster, but not in cases where disclosure could avert a longer-term health risk. Those who ground researchers' duty to disclose incidental findings in researchers' duties of easy rescue presumably have a broader version of the duty of easy rescue in mind.

A moderate (but still relatively undemanding) version of the duty of easy rescue can be formulated as follows: "If the cost . . . to someone of performing an action X . . . is sufficiently small to be reasonably bearable, and the resulting [or expected] benefit to other people (or harm that is prevented) is large relative to the cost, then the agent ought to do X."³³ This moderate formulation of the duty of easy rescue is consistent with the view that incidental findings should be disclosed *at least* in cases where the findings have high clinical validity and utility. If providing this information could avert significant

harm—and assuming that disclosure would not impose unreasonable burdens on researchers—then these findings ought to be disclosed.

This formulation of the duty of easy rescue is admittedly broader than others that have been discussed in relation to incidental findings.³⁴ It is not limited to *imminent* risks of *extreme* harm; instead, it applies to the broader category of *harms that are large relative to the cost of preventing them* (and where the cost of preventing this harm is reasonably bearable). Although this makes our version of the duty broader than some other formulations, we think it nonetheless captures a plausible—and uncontroversial—moral view.

Duties of easy rescue can provide a clear and uncontroversial rationale for disclosing incidental findings to participants in imaging research. There may be further reasons that researchers ought to disclose such findings. For example, it could be argued that researchers have stronger duties of beneficence toward research participants than toward strangers outside the research project because of some special feature of the research relationship.³⁵ Alternatively, it might be thought that a principle of reciprocity supports the disclosure of incidental findings as a kind of compensatory benefit to those who contributed to the research enterprise.³⁶

Another possible line of argument (that has not yet been developed in the literature) might ground the duty to disclose incidental findings in our responsibilities toward those who are especially vulnerable to us. The idea here is that we have a special responsibility to protect the interests of those whose welfare is highly dependent on our actions and who are, in this sense, particularly vulnerable to our choices.³⁷ Because healthy research participants are unlikely to undergo medical imaging outside of the study, researchers are in a unique position to inform participants about unexpected abnormalities—which might create a vulnerability-based moral obligation for researchers to promote participants' well-being. Importantly, however, we do not need to appeal to relationship-, reciprocity-, or vulnerability-based obligations to argue that researchers have moral reasons to disclose incidental findings to research participants. The moderate, uncontroversial version of the duty of easy rescue sketched above is enough to establish that researchers ought to disclose incidental findings, at least

in those cases where it is easy for researchers to do so and the benefits could be substantial.

Our argument so far has appealed to common morality. By describing scenarios involving easily avertable peril—such as Singer’s example of the child drowning in the pond—we have attempted to provide intuitive grounds to think that people ought to perform easy rescues. Whether our reasons to perform easy rescues are best understood in terms of consequentialism, contractarianism, virtue ethics, or some other branch of moral theory remains an important open question. However, for the purposes of this article, the important point is simply that we generally ought to perform easy rescues; precisely *why* we ought to do so is not essential to our argument.³⁸

This is not necessarily the complete moral picture. It might be the case that researchers have moral duties to disclose incidental findings even if providing this information would not constitute an easy rescue (although whether a researcher has such duties might depend on the nature of the researcher-participant relationship, the nature of the study procedures, the availability of imaging services to the participant population, and/or other factors.) The duty of easy rescue, however, can provide a useful minimum standard that researchers owe to research participants. Regardless of their other obligations, researchers—like all moral agents—certainly ought to perform easy rescues. Even if we limit our analysis to this uncontroversial moral duty, it turns out that researchers ought to disclose (at least some kinds of) incidental findings. In the following section, we consider whether they might also have rescue-based duties to seek this information.

THE DUTY TO LOOK

We have argued that researchers have a moral obligation, grounded in the duty of easy rescue, to disclose at least some kinds of incidental findings. Can the duty of easy rescue also ground a moral duty to actively look for such findings? At first blush, this might seem to stretch the duty of easy rescue too far. The archetypal scenarios used to illustrate the duty of easy rescue involve an unexpected encounter with a person in dire peril (such as the man passed out in a puddle or the child drowning in a pond). Duties of easy rescue are often thought to apply *only* when we face these kinds

of unanticipated emergencies. According to this view, the duty of easy rescue does not compel us to actively look for opportunities to perform easy rescues and so cannot ground a moral obligation to actively look for incidental findings.³⁹

This view is mistaken. The duty of easy rescue and the duty to look are tightly intertwined. Indeed, the duty to look can be understood as a facet of the duty of easy rescue. Whatever moral considerations justify performing easy rescues—whether grounded in consequentialism, contractarianism, or virtue ethics—*also* justify looking for opportunities to perform easy rescues. If we recognize a duty of easy rescue, then we recognize that we are sometimes morally required to attempt to prevent serious harm to others. We are morally required to do so even if doing so imposes some costs on us (albeit costs that are both reasonably bearable and small, relative to the benefits to the other party.) One way we can prevent harm to others is by rescuing people from danger. This, however, does not exhaust the possibilities. It may sometimes be possible to avert further harms by looking for opportunities to rescue others. If there are some circumstances where we are morally required to (attempt to) rescue others, then presumably there are also some circumstances where we are morally required to investigate possible problems. It seems, then, that once we recognize a (limited) duty of easy rescue, we are also required to recognize a (limited) duty to look. For example, not only is one morally required to rescue a drowning infant from a shallow pond, one is also required to look and watch if an infant is crawling around a shallow pond and is in danger of falling in. It would be immoral to deliberately avert one’s gaze simply not to see the tragedy unfold.

Why, then, is it often thought that we have a duty to perform easy rescues but not a duty to hunt for possible problems? One argument holds that the duty of easy rescue is (or can be rendered) undemanding, whereas the duty to look is unreasonably onerous. As mentioned above, the duty of easy rescue is sometimes thought to be constrained to cases where we directly and unexpectedly confront an opportunity to prevent harm. The duty to look cannot be constrained in this way; by definition, a moral duty to look requires us to take action in contexts where we do not know for certain if anybody needs our help. This has led some to conclude that the duty to

look is effectively boundless, in which case recognizing such a duty would commit one to searching, as a full-time job, for persons in need of rescue.⁴⁰ The problem, of course, is that a moral duty to perpetually search for rescue opportunities would be implausibly demanding.

This argument fails. As we have seen, concerns about demandingness are not unique to the duty to look. Broad versions of the duty of easy rescue are also highly demanding. However, this concern about the duty of easy rescue can be addressed by narrowing the duty's scope. It is likewise possible to narrow the scope of the duty to look to render it less demanding. For example, we might constrain the duty to look so that it applies only when the chance of finding someone in need of help is sufficiently high and the costs we would incur by looking are sufficiently low. In the context of imaging, it might require radiologists to look for a predefined set of incidental findings that would be disclosed to participants. Moderate versions of the duty of easy rescue are not unreasonably onerous because situations where we can conduct easy rescues are rare. Similarly, moderate versions of the duty to look are not unreasonably onerous because we will rarely find ourselves in a situation where the likely benefits of looking for persons to rescue greatly outweigh the onerousness of the search. Under ordinary circumstances, we do not have a moral duty to wander around looking for opportunities to save others. Yet there are presumably at least *some* circumstances—however rare—where it is worthwhile to look for opportunities to perform easy rescues.

Some of the skepticism regarding the duty to look might reflect the unusualness of contexts where we ought to look for rescue opportunities. As Joel Feinberg points out, we live in societies that have largely preempted individuals' duties to prevent harm to others. We collectively support specialized jobs, roles, and institutions (such as emergency services) that perform much of this work, which usually suffices to free us of the need to seek out people in peril.⁴¹ The context of imaging research is different. In the absence of widespread imaging-based screening programs, researchers are in a unique position to detect abnormalities that might have significant implications for research participants' well-being. As we have seen, the training and instructions of those who conduct the scans, decisions about whether to subject scans to routine review, and the scan

protocol itself can affect the number of incidental findings that are identified. Accordingly, choices made by the researchers and research institutions when designing research can determine whether, and how often, researchers are placed in a position to perform easy rescues. If we hold that researchers are sometimes morally required to perform these easy rescues, then we also ought to hold that researchers sometimes have a moral duty to bring about circumstances where these easy rescues can be performed.

The upshot is that we have a (limited) duty to look for much the same reason that we have a (limited) duty of easy rescue. We have defended a moderate version of the duty of easy rescue that requires researchers to disclose incidental findings when this information is expected to yield significant benefits for research participants and the costs of disclosing this information are both small relative to the benefits and reasonably bearable. In line with this moderate duty of easy rescue, a moderate version of the duty to look would require researchers to seek out incidental findings when the potential benefits for research participants are significant and the costs of looking are both small relative to the expected benefits and reasonably bearable for the research team and institution. If we accept the above version of the duty of easy rescue, then we should also accept the above version of the duty to look. All else being equal, researchers should both disclose incidental findings that can promote participants' well-being and design research to promote the detection of such findings.

LIMITS OF THE DUTY TO LOOK FOR INCIDENTAL FINDINGS

We have argued that researchers have moral reason to actively search for incidental findings. This should not be taken to suggest that researchers must always design research to maximize the yield of incidental findings. The duty to look is not an absolute moral obligation; there are limits to its force and scope. This section clarifies what some of these limits are and highlights two ways that the duty to look can be overridden.

First, it is important to consider whether strategies to increase the yield of incidental findings *would* effectively promote participants' well-being. Aggressively searching for incidental findings might have the

opposite effect. Consider the option of subjecting all research scans to systematic radiologist review, which is perhaps the most widely discussed means of detecting incidental findings that might otherwise go unnoticed. The U.K. Biobank has recently compared systematic radiologist review with a less aggressive approach: radiographer “flagging” of suspicious scans, with radiologist confirmation of potentially serious incidental findings. Systematic radiologist review resulted in fewer false negatives (that is, fewer potentially serious diagnoses were missed), but it also resulted in a disproportionately greater number of false positives (resulting in unnecessary investigation of nonserious final diagnoses.) These false positives caused needless anxiety and unnecessary clinical assessment, which had negative impacts on some participants’ finances, access to insurance, and emotional well-being. Compared to radiographer flagging, the overall balance of harms and benefits of systematic radiologist review was ultimately considered uncertain.⁴² If it turns out that systematic radiologist review (or other strategies aimed at increasing the yield of incidental findings) would produce more harm than good, then we should not adopt them. However, this is not because researchers do not have a duty to look. This is because the duty to look—which we view as one aspect of a more general duty of beneficence—does not require us to act in ways that would produce more harm than good, either in general or in this specific context.

Second, it is important to consider the costs of actively looking for incidental findings. Strategies such as systematic radiologist review, acquiring diagnostic-quality images, and training radiographers to identify potential incidental findings could have significant resource implications, particularly in institutions that lack access to radiological expertise. Moderate versions of the duty to look recommend that we search for incidental findings only insofar as the costs of doing so are reasonably bearable. They do not, however, recommend looking for incidental findings if doing so would jeopardize the broader aims of the research enterprise—that is, to produce socially valuable, generalizable knowledge. Researchers and research institutions do not have a moral duty to look for incidental findings if the costs of doing so are prohibitive or highly burdensome (which might be the case in low-resource settings with limited access to radiology expertise.) Those who are consider-

ing whether to implement measures such as systematic radiological review *should* consider factors such as time and resource costs. Again, however, this is just to say that the duty to look has limits; it is not to say that researchers lack any duty to look in the first place.

Like the duty of easy rescue, the duty to look is defensible; it does not require researchers to attempt to identify incidental findings regardless of the costs to researchers, participants, or the broader research enterprise. It is nonetheless important to recognize that such a duty exists. In general, moderate versions of the duty to look recommend designing research to increase the detection of incidental findings, *provided that* these measures neither impose unreasonable costs on the research enterprise nor cause greater harm than good. We think it is important to conduct further research into the benefits and burdens of radiologist review, diagnostic-quality scans, automated image-processing tools, and other strategies to facilitate the detection of incidental findings. In the meantime, we expect that it will often be appropriate to train researchers who carry out scans to identify and flag at least some kinds of incidental findings—such as those that would yield the clearest medical benefit.

By contrast, our argument has clear implications for the use of strategies to *decrease* the detection of incidental findings. It will rarely (if ever) be acceptable to design research to avoid incidental findings, such as by decreasing image field of view or actively discouraging researchers from looking for or flagging incidental findings. Taking into consideration the duty to look, such measures might be permissible only if they are necessary to prevent researchers or their institutions from incurring costs that are not reasonably bearable. Unless necessary for financial reasons, researchers should not seek to minimize the detection of incidental findings. Given that there is a moral duty to look for easy rescue opportunities, researchers should search for incidental findings unless they have good reason to do otherwise.

CONCLUSION

Incidental findings are no longer unexpected; they occur regularly in imaging research, and their incidence is predictably affected by the research design. The ethical issues associated with incidental findings will grow only more important as the scale of imag-

ing research continues to grow. It is therefore crucially important to reconsider whether, and to what extent, researchers should design research to help detect the kinds of incidental findings that should be disclosed to participants. We have argued that if researchers have a duty to disclose a particular incidental finding, they also have a duty to look for such a finding. Predefined lists of reportable incidental findings would be useful tools for identifying what researchers should look for.

We have argued that researchers have some duties of beneficence toward study participants. One such duty is the duty of easy rescue, according to which researchers ought to disclose incidental findings when doing so will have clear and significant benefits for participants. Another duty—less widely recognized but no less important—is the duty to look, according to which researchers ought to actively search for incidental findings that could benefit research participants. Although it is widely thought that researchers have a moral obligation to disclose (certain categories of) incidental findings, many argue that researchers do not have a moral obligation to actively look for such findings. We have argued that the duty of easy rescue and the duty to look are two sides of the same coin. If researchers have a (limited) moral duty to disclose incidental findings when doing so would benefit participants, then they also have a (limited) moral duty to seek such findings out. ♦

Julian J. Koplin, PhD, is a research fellow with the Biomedical Ethics Research Group, the Murdoch Children's Research Institute, and the Melbourne Law School at the University of Melbourne; **Martin R. Turner, MA, MBBS, PhD**, is a professor of clinical neurology and neuroscience in the Nuffield Department of Clinical Neurosciences at Oxford University and is an honorary consultant neurologist to the John Radcliffe Hospital in Oxford; and **Julian Savulescu, MB, MA, PhD**, is the Uehiro chair in practical ethics at the University of Oxford, directs the Oxford Uehiro Centre for Practical Ethics, and codirects the Wellcome Centre for Ethics and Humanities.

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14. Presidential Commission for the Study of Bioethical Issues, *Anticipate and Communicate: Ethical Management of Incidental and Secondary Findings in the Clinical, Research and Direct-to-Consumer Contexts* (Washington, DC: Presidential Commission for the Study of Bioethical Issues, 2013), 91.

15. Wolf et al., "Managing Incidental Findings in Human Subjects Research," 236. The working group does suggest that researchers may have an obligation to intentionally look for incidental findings if the researcher is the participant's treating physician.

16. Miller, Mello, and Joffe, "Incidental Findings in Human Subjects Research," 278.

17. Richardson, H. S., "Incidental Findings and Ancillary Care Obligations," *Journal of Law, Medicine & Ethics* 36, no. 2 (2008): 256-70, at 266-67.

18. Garrett, J. R., "Collectivizing Rescue Obligations in Bioethics," *American Journal of Bioethics* 15, no. 2 (2015): 3-11.

19. Wardlaw et al., "Acting on Incidental Findings in Research Imaging"; Royal College of Radiologists, *Management of Incidental Findings Detected during Research Imaging*.

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21. Gibson, L. M., et al., "Impact of Detecting Potentially Serious Incidental Findings during Multi-modal Imaging," *Wellcome Open Research* 2 (2017): doi:10.12688/wellcomeopenres.13181.1.

22. See, for example, Berkman, B. E., "Refuting the Right Not to Know," *Journal of Health Care Law and Policy* 19 (2016): 1-72; Burke, W., et al., "Recommendations for Returning

Genomic Incidental Findings? We Need to Talk!," *Genetic Medicine* 15, no. 11 (2013): 854-59. Put in terms of the duty of easy rescue, the question here is whether we ought to allow research participants to make an autonomous decision *not* to be rescued or—conversely—whether the duty of easy rescue is so strong that we ought to block this option.

23. Richardson, H. S., *Moral Entanglements: The Ancillary-Care Obligations of Medical Researchers* (Oxford: Oxford University Press, 2012), 2-3.

24. Ibid.; Rangel, E. K., "The Management of Incidental Findings in Neuro-imaging Research: Framework and Recommendations," *Journal of Law, Medicine & Ethics* 38, no. 1 (2010): 117-26.

25. Richardson, "Incidental Findings and Ancillary-Care Obligations."

26. Bentham, J., *An Introduction to the Principles of Morals and Legislation*, vol. 2 (London: W. Pickering, 1823), 255.

27. Singer, P., "Famine, Affluence, and Morality," *Philosophy & Public Affairs* 1, no. 3 (1972): 229-43, at 231.

28. We are describing a moral duty here, not a legal one; we are saying that people morally ought to perform easy rescues (regardless of whether this moral duty is or can be enforced).

29. Wolf, "Return of Individual Research Results and Incidental Findings"; Bredenoord, A. L., et al., "Disclosure of Individual Genetic Data to Research Participants: The Debate Reconsidered," *Trends in Genetics* 27, no. 2 (2011): 41-47; Ulrich, M., "The Duty to Rescue in Genomic Research," *American Journal of Bioethics* 13, no. 2 (2013): 50-51; Ossorio, P., "Taking Aims Seriously: Repository Research and Limits on the Duty to Return Individual Research Findings," *Genetics in Medicine* 14, no. 4 (2012): 461-66; Gliwa, C., et al., "Institutional Review Board Perspectives on Obligations to Disclose Genetic Incidental Findings to Research Participants," *Genetics in Medicine* 18, no. 7 (2016): 705-11.

30. Singer, "Famine, Affluence, and Morality."

31. This is not necessarily a defect in the view that we have broad duties of easy rescue; perhaps we *do* have a strong moral obligation to donate to effective charities. However, we are interested in whether the duty to disclose incidental findings can be grounded in a less controversial version of the duty of easy rescue.

32. Smith, P., "The Duty to Rescue and the Slippery Slope Problem," *Social Theory and Practice* 16, no. 1 (1990): 19-41.

33. Giubilini, A., et al., "Quarantine, Isolation and the Duty of Easy Rescue in Public Health," *Developing World Bioethics* 18, no. 2 (2017): 182-89, at 186. Disclosing incidental findings can have serious negative effects. For example, a minor incidental finding could prompt lifelong anxiety (which, in turn, could contribute to heart disease), or repeated MRI scans with gadolinium to monitor a benign growth could eventually bring about renal failure. The duty of easy rescue does not provide reason to disclose such findings if the expected bal-

ance of harms versus benefits is highly uncertain or negative.

34. Berkman, B. E., S. C. Hull, and L. Eckstein, "The Unintended Implications of Blurring the Line between Research and Clinical Care in a Genomic Age," *Personalized Medicine* 11, no. 3 (2014): 285-95; Beskow, L. M., and W. Burke, "Offering Individual Genetic Research Results: Context Matters," *Science Translational Medicine* 2, no. 38 (2010): 38cm20.

35. Sheehan, M., "Resources and the Rule of Rescue," *Journal of Applied Philosophy* 24, no. 4 (2007): 352-66; Miller, Mello, and Joffe, "Incidental Findings in Human Subjects Research."

36. Wolf et al., "Managing Incidental Findings in Human Subjects Research"; Illes et al., "Incidental Findings in Brain Imaging Research"; Bunnik and Vernooij, "Incidental Findings in Population Imaging Revisited."

37. Goodin, R. E., *Protecting the Vulnerable: A Reanalysis of Our Social Responsibilities* (Chicago: University of Chicago Press, 1985). Goodin's use of the term "vulnerable" refers to those whose welfare depends crucially on our actions.

38. An anonymous reviewer suggested that Aristotelian virtue ethics might prove especially germane to the topic of incidental findings. A virtue ethics approach might analyze the management of incidental findings in terms of virtue, personal responsibility, the good of research subjects, and the good of the overall community. This approach might support a position similar to the one we defend in our article without using the language of moral duties.

39. Miller, Mello, and Joffe, "Incidental Findings in Human Subjects Research"; Ulrich, "The Duty to Rescue in Genomic Research."

40. Smith, "The Duty to Rescue and the Slippery Slope Problem."

41. Feinberg, J., *The Moral Limits of the Criminal Law*, 4 vols. (New York: Oxford University Press, 1984), 170.

42. Gibson et al., "Impact of Detecting Potentially Serious Incidental Findings."